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PUBLIC HEALTH ASPECTS OF RHEUMATIC HEART DISEASE

INCIDENCE AND MEASURES FOR CONTROL

HOMER F. SWIFT, M.D.

NEW YORK

Public recognition of the nature and requirements of the problems of rheumatic fever and rheumatic heart disease has lagged far behind the attention given to other diseases of less numerical and economic importance. Some reasons for this attitude are as follows: Because limited facilities compel those in charge of public health services to consider how they may best expend funds, other pressing problems offer better opportunities for effective control. Death-dealing epidemic diseases earliest required reporting because quarantine measures often limited their spread. Again, discovery of a specific etiologic agent is a factor in making a disease notifiable, witness the discovery of the tubercle bacillus; but a review of the history of notification of tuberculosis reveals how slow has been the attainment of our approximately exact statistical knowledge concerning this disease, which today is probably not more than 75 per cent accurate, at least in respect to morbidity. Even less exact is the information derived from reporting syphilis. With the remarkable acquisition of knowledge concerning syphilis in the first fifteen years of this century, it was obvious that it could be stamped out and society spared the necessity of providing for invalids with late syphilitic vascular, nervous and mental disease annually costing many times the outlay for efficient prophylaxis. Nevertheless prudery overcame prudence, and only recently has there been undertaken in this country what was possible from the scientific point of view twenty years earlier.

Another crippling disease might well be contrasted with rheumatic fever in its public health aspects, namely poliomyelitis. Both diseases in their early acute phases kill only a small portion of those affected; both cripple, one obviously, the other insidiously. In poliomyelitis, a single attack confers almost complete immunity, in rheumatic fever one attack apparently increases susceptibility to recurrences which induce progressive cardiac crippling, eventually leading to death. Knowledge concerning the virus causing infantile paralysis has not led to any effective therapeutic or prophylactic measures. While the number of symptom-free cases of poliomyelitis may be many times that of the crippling cases, the latter comprise only a fraction of the individuals suffering from rheumatic heart disease. The relative numerical prevalence of these two diseases can be inferred from the following figures:[1] In New York City, during the ten year period 1930-1939, there were reported 7,811 cases of poliomyelitis with 693 deaths, but this includes the epidemic of 1931, with 4,138 cases and 504 deaths, and that of 1935, with 2,054 cases and ninety-one deaths. While there are no data available for the number of cases of rheumatic fever, in 1938 alone there were reported 147 deaths from rheumatic fever and 958 from rheumatic heart disease.[2] As indicated later, these figures are probably too low; nevertheless the mortality in a single year from rheumatic fever and rheumatic heart disease was almost double that of poliomyelitis for a whole decade. In other words, the economic importance of rheumatic fever is apparently much greater than that of infantile paralysis. The relative attention given them by the lay public, health authorities and vital statisticians is in striking contrast. Some idea concerning the occurrence of poliomyelitis can be gained from our public health reports, relatively little concerning the other because it is not reportable. And searching among the reported deaths from heart disease gives only an inkling of the relative part played by rheumatic fever because this well recognized etiologic factor has but recently been required on death certificates. When the desirability of reporting is urged, one encounters the objection of mistaken diagnosis both during illness and in deaths without postmortem examinations; but, in general, vital statistics, even with their recognized inaccuracies, are our most useful source of knowledge concerning the relative frequency and economic importance of various diseases and of the trends of increasing or decreasing incidence. Argument directed toward the desirability of attaining this information by requiring notification should not be regarded as fanatical. Even if the machinery cannot be all set in motion immediately it would be worth starting, for the two other great disabling chronic infections, tuberculosis and syphilis, are on the decline; and the existing institutions caring for patients with tuberculosis and late syphilitic nervous and mental diseases may in part be eventually devoted to the more effective rest treatment of patients with rheumatic heart disease. Had rheumatic fever been made a reportable disease twenty years ago, we could today present fairly accurate figures concerning the relative urgency of the problem and hence might better provide the technic whereby one class of invalids could be substituted for another.

With the requested reporting of rheumatic fever as an etiologic factor in death from heart disease, in New York City, some idea of the relative death-dealing effects of other infectious diseases and rheumatic fever may be obtained. In 1938[3] there were 3,833 deaths from all forms of tuberculosis contrasted with 1,105 reported for rheumatic fever and rheumatic heart dis-

Second John H. Wyckoff Lecture for 1939-1940.
From the Hospital of the Rockefeller Institute for Medical Research.
Read before the New York University College of Medicine, Jan. 30, 1940.

1. Quart. Bull. New York Dept. Health **8**: 8 (Feb.) 1940.
2. Data furnished by Miss Claire Lingg, New York Heart Association.
3. Quart. Bull. New York City Dept. Health **8**: 9 (Feb.) 1940.

ease. Or contrast the mortality from rheumatic fever with that from the following reportable diseases in the same year: diphtheria twenty-six, measles forty-two, whooping cough 105, scarlet fever seventeen, epidemic meningitis fifty-three and poliomyelitis four, a total of 247.[1] In other words, there was a ratio of 4.5 deaths from rheumatic fever and rheumatic heart disease to each death from all of these six reportable infectious diseases combined. Hedley[4] reported a mortality ratio of 3.6 to 1 for the same diseases in Philadelphia in the year 1936. These figures are presented not with the idea of doing less with the required reportable diseases but of emphasizing the relatively greater size of the rheumatic fever problem and the consequent desirability of also making this disease notifiable.

STATISTICS OF NEW YORK HEART ASSOCIATION

The lack of approximately reliable data from the Bureau of Vital Statistics of New York City until recently has fortunately not left us entirely without some other means of estimating the size of the problem, because the New York Heart Association for more than twenty years has gathered statistics from the patients in the various cardiac clinics which met the minimal requirements of that association. There are now fifty-six such clinics, where the diagnosis follows a uniform plan laid down in the official criteria; hence the data are probably more accurate than any gathered by compulsory notification. The admission figures for four years are shown in table 1.[5]

TABLE 1.—*New Cases of Rheumatic Heart Disease Admitted to Cardiac Clinics of the New York Heart Association, 1935-1938*

Year	Number of Clinics	New Cases: Children	Adults	Total	Etiology Rheumatic Fever: No.	Per Cent	Etiology Unknown: No.	Per Cent	Rheumatic Fever and Unknown: No.	Per Cent
1935	50	1,382	2,529	3,911	1,588	40.6	508	13.0	2,096	53.6
1936	53	1,172	2,463	3,635	1,313	36.1	438	12.0	1,751	48.1
1937	54	1,256	2,364	3,620	1,390	38.4	397	11.0	1,787	49.4
1938	56	1,332	2,732	4,064	1,506	37.0	430	10.6	1,936	47.6
1936	24	1,022	.....	.....	513	50.1	217	21.2	730	71.3
1937	24	1,074	.....	.....	585	54.4	180	16.8	765	71.2
1938	25	1,031	.....	.....	606	58.7	188	18.1	794	76.8
1936	23	.....	2,219	.....	625	35.5	183	12.2	808	47.7
1937	24	.....	2,136	.....	605	35.3	181	11.8	786	47.1
1938	22	.....	2,440	.....	715	29.3	198	8.1	913	37.4
		Children and Adults								
1936	6		394		175	44.5	58	15.0	233	59.5
1937	6		410		200	48.7	36	8.8	236	57.5
1938	6		369		178	48.2	38	10.3	216	58.5

In 1938, among 1,031 children admitted to twenty-five children's cardiac clinics, 59 per cent had a definite diagnosis of rheumatic heart disease and in another 18 per cent the diagnosis was unknown. All students of this disease recognize that a fair proportion of patients with rheumatic carditis have no other outstanding symptoms of rheumatic fever; hence a rate of 76 per cent of rheumatic heart disease among this 1,031 new cases seems a very conservative estimate. The actual number was 794. In the same year 126 other children who had been previously discharged were readmitted; probably most were suffering from recurrences of rheumatic heart disease severe enough to require medical attention. In children these relapses are indicative of reactivation of the rheumatic inflammation in the heart muscle and valves, so it seems safe to add 100 to the 794, or a total of at least 900 who were admitted to these twenty-five outpatient children's clinics with enough active rheumatic carditis to require special clinic care. This, however, is only part of the story among sick rheumatic children, for there were a total of 7,759 children treated by these clinics, including new cases, readmissions and old cases. If we apply the modest figure of 66 per cent as the proportion of these patients who probably had rheumatic fever as an etiologic factor in their illness, we see that at least 5,000 children were in need of supervision because of rheumatic heart disease in these clinics alone.

While this case load for children is impressive, it is obviously much less than the total imposed by rheumatic fever, first because many cardiac children do not enter these clinics and second because the long periods of invalidism due to rheumatic heart disease usually come later in life. This is illustrated by the data for 2,430 adults admitted for the first time to these clinics in the year 1938. Among these the etiologic factor was definitely given as rheumatic fever in 715, or 29 per cent, and unknown in an additional 8.1 per cent. Combining the new admissions of both children and adults, it is seen that this disease made approximately 37 per cent of the case load in new cases in this four year period with an additional 11 per cent in the unknown category. It seems safe, therefore, to consider 45 per cent as a safe estimate of new patients applying to these clinics for care whose heart disease rested on a rheumatic basis. If we apply the estimate of 45 per cent to the total cases on the active roster of these clinics, it appears that at least 8,700 were of rheumatic origin. The exact number of these patients who were suffering from active rheumatic inflammation of the heart valves and muscle compared with disability due to scarring, and simple hypertrophy and dilatation is a matter of conjecture, but that it was several thousand can be safely stated for the following reasons: Only exceptionally do children with rheumatic heart disease have symptoms of cardiac failure without active rheumatic disease. One may therefore take it that such a child needs the type of treatment that will help him overcome a chronic infection, as well as therapeusis for relieving the signs of cardiac insufficiency. While the element of active infection may not be playing a role in inducing symptoms among so high a proportion of adults, because by this time scarring of the tissues and wearing out of a long overworked mechanically subnormal organ are important factors in cardiac failure, still the baleful influence of active rheumatic disease in adults is well known. For example, careful microscopic examination of the hearts of rheumatic subjects dying from chronic heart disease has revealed evidence of active rheumatic inflammation in the organs of from 70 to 80 per cent of those under 40 years of age.[6] While figures are not at present available concerning the age grouping of the eight to nine thousand clinic patients with rheumatic heart disease, it is a well recognized fact that relatively few outpatient clinic patients fall into the old age groups. By applying this knowledge to our analysis of the problem of rheumatic infection among the more than 19,000 cases of heart disease seen in these fifty-six clinics in a single year, 1938, it is obvious that in many thousand of them active rheumatic infection was playing an important role in inducing invalidism.

4. Hedley, O. F.: Mortality from Rheumatic Heart Disease in Philadelphia During 1936, Pub. Health Rep. **52**: 1907 (Dec. 31) 1937.

5. Data compiled from summary of clinic reports, New York Heart Association Committee on Cardiac Clinics.

6. de la Chapelle, C. E.; Graef, Irving, and Rottino, Antonio: Studies in Rheumatic Heart Disease: An Analysis of One Hundred and Nineteen Hearts with Special Reference to the Relationship of Auricular Fibrillation to Mitral Valvular Deformity and Certain Rheumatic Tissue Changes, Am. Heart J. **10**: 62 (Oct.) 1934. Rothschild, M. A.; Kugel, M. A., and Gross, Louis: Incidence and Significance of Active Infection in Cases of Rheumatic Cardiovalvular Disease During the Various Age Periods: Clinical and Pathological Study, Am. Heart J. **9**: 586 (June) 1934.

Special attention has been given to these only approximately correct data because they represent the results of study by a well qualified group of physicians; they include only living patients and hence indicate somewhat the size of the facilities required for the adequate care of these patients, if we regard as good practice provision for prolonged and supervised rest, proper nutrition,

TABLE 2.—*Position of Heart Disease Among First Three Causes of Death in New York City and New York State in 1938*

Age	Males		Females	
	New York City	Rest of State	New York City	Rest of State
5-14	2d	X	1st	1st or X
15-19	1st	2d	2d	3d
20-24	2d	2d or 3d	2d	3d
25-34	3d	2d or 3d	2d	3d
35-39	2d	2d	2d	2d
40-44	1st	1st	2d	2d
45-59	1st	1st	1st or 2d	1st or 2d
60-74	1st	1st	1st	1st
75-84	1st	1st	1st	1st
85 and over	1st	1st	1st	1st

X Not included in list of first three causes.

and guarding against such infection as apparently set off the rheumatic explosion. They by no means include all the patients in New York City who probably require professional care because of rheumatic heart disease nor do they represent the total case load imposed by rheumatic fever, which in the acute and subacute stages forces bed rest on many of its victims; although, let it be mentioned parenthetically, the practice of relieving with drugs a rheumatic patient of his painful and rest-imposing symptoms and then allowing him to become ambulatory has by no means become antiquated. The necessity for providing beds for other more acutely ill patients often causes hospital authorities to urge the removal of the symptom-free rheumatic fever patient to his home or to the outpatient department when good practice indicates prolonged bed rest. The average child with his first or second attack of rheumatic fever often has little and only transitory arthritis and is usually free from any symptoms of heart involvement even though there are physical and laboratory signs of active carditis. Were adequate and properly organized sanatoriums available for these patients, it is doubtful whether they should be kept long in general hospital wards, because it is difficult to maintain adequate disciplinary and recreational facilities and provide against reinfection with streptococci, which may induce a serious relapse. In other words, under existing organizations a patient who requires chronic treatment is placed under conditions in which acutely ill individuals receive special attention. Certainly, transfer to outpatient care is not the proper answer to his requirements, and yet in many instances this is the only way of meeting the demands imposed by a large number of patients of all classes.

OTHER SOURCES OF INFORMATION

Because size, both relative and absolute, is one of the important factors which accentuate the urgency of any public health program, it seems worth while to explore further the sources of available information. Because no etiologic data are recorded in the official lists of death from heart diseases, if one is to obtain any idea of the approximate number of deaths in which rheumatic fever has had an important role in the ultimate fate of the decedents one must use some such device as applying etiologic interpretation gained from studies of large groups of cardiac patients of all classes and ages.

While heart diseases in general have become the leading cause of death, and obviously most of these fatalities occur among older people, nevertheless in the age periods 5 to 30, when rheumatic fever provides the chief etiologic background for the heart failure, heart disease stands very prominent among the three most important causes of death in both New York City and State, as is illustrated in the figures abstracted in table 2.[7] Such official figures indicate most clearly how important it is not to relegate the interest in heart diseases entirely to the field of geriatrics.

While it is generally recognized that rheumatic fever plays the chief etiologic role in cardiac deaths in the age groups 5 to 30, it is desirable to gain some impression as to its relative importance later in life. For this purpose one may interpret in more detail the official lists of death with knowledge gained from etiologic analysis of large groups of living cardiac patients. Among the most reliable data in this respect for an analysis of New York vital statistics are those of Wyckoff and Lingg [8] because they include patients from hospital wards, outpatient clinics and private practice. If one applies such distribution coefficients to the cardiac deaths in New York State in 1938, included under the categories 90 to 95 of the 1929 International List of the Causes of Death, and further subdivided according to decades, one obtains the figures shown in table 3.[9]

Some interesting points emerge from such a tabulation. In recent years the emphasis laid on the prevalence of rheumatic heart disease among children and of degenerative cardiovascular disease in the aged has diverted our attention statistically away from the influence of rheumatic fever as a cause of cardiac disability in the fourth and fifth decades; and yet, if the figures shown are approximately correct, rheumatic heart disease takes a larger toll in the second half of life than in the first. Such an impression is strengthened by the reported deaths from rheumatic heart disease in New York City for the same year.[2] Among these 958 deaths 377, or 39 per cent, were in subjects under 30, 411 in

TABLE 3.—*Total Number of Deaths, Categories 90-95, New York State in Age Groups 1-59*

Age, Years	New York City	New York State (Excluding New York City)	Per Cent *	Estimated Number Dead of Rheumatic Heart Disease		
				New York City	New York State	Total
Under 5	16	51				
5- 9	72	113	90	65	102	167
10-19	277	424	82	227	348	575
20-29	403	600	75	302	450	752
30-39	751	1,138	58	436	660	1,096
40-49	2,327	3,787	29	675	1,098	1,773
50-59	4,539	7,714	9	409	694	1,103
				2,114	3,352	5,466

* Percentage estimated on distribution of rheumatic fever as etiologic factor of heart disease in various age groups by Wyckoff and Lingg.

those between 30 and 59, and seventy in patients over 60 years of age; but this does not include those reported as dying from rheumatic fever. Hedley [4] has made special reference to the importance of rheumatic heart disease as a cause of death in the latter half of life because he found in Philadelphia during 1936 that only 40 per cent of decedents from this affliction fell in the

7. Abstracted from table on page xl of Fifty-Ninth Annual Report of the New York State Department of Health, 1938.

8. Wyckoff, J., and Lingg, Claire: Statistical Studies Bearing on Problems in the Classification of Heart Diseases: II. Etiology in Organic Heart Disease, Am. Heart J. **1**: 446 (April) 1926.

9. Abstracted from tables 18 and 19, pp. 46-49, Fifty-Ninth Annual Report of the New York State Department of Health, 1938.

first three decades of life. DeGraff and Lingg's [10] analysis of a large group of fatal cases with rheumatic fever as the background for the crippled heart showed definitely that the fourth decade contains many fatal cases; and among Wyckoff and Lingg's [8] living patients in the sixth decade almost 30 per cent could attribute to rheumatic fever an etiologic role in their heart disease.

The difference between the number of deaths in New York City, estimated in table 3, 2,114, and the 958 reported as due to rheumatic heart disease, obviously requires some discussion. An additional 147 deaths were reported as due to rheumatic fever, which immediately raises it to a total of 1,105. Moreover, the figure 2,100 does not seem out of line with data derived from the case load imposed by rheumatic heart disease in the New York Heart Association cardiac clinics in 1938. As already mentioned, between 7,000 and 8,000 patients seen in that year were reasonably certain to have had rheumatic fever as a cause of their disability. DeGraff and Lingg [10] found an average of three years between the onset of heart failure and the final episode; in other words, each death might be considered to represent an average of three years of invalidism of a degree that would cause the patient to seek medical assistance. Applying the factor 3 to the total of 2,100 estimated deaths would give an invalidism rate of 6,300, which is less than the number of patients with rheumatic heart disease seen in the New York Heart Association clinics alone; for to this number should be added those in other clinics, private patients and those who because of marked disease were no longer ambulatory. The total estimate in table 3, therefore, seems conservative, even though the age distribution may be inaccurate.

In order to determine the probable size of the rheumatic fever and rheumatic heart disease problem for the entire country, some other statistics must be considered. Hedley [11] has recently presented data indicating that the incidence of rheumatic fever is declining. This is based on the thesis that the number of deaths in the age groups 5 to 24, classified under categories 90 to 95 in the International List of Causes of Death of 1929, or of categories 87 to 90 of the 1920 list, might be considered a valid index of the incidence of rheumatic heart disease and that changes in the rates per hundred thousand based on this index could be used as a basis for indicating the trends as to the incidence of rheumatic heart disease. Much valuable information, presented in Hedley's paper, will be discussed later. That the total deaths from heart disease in the age period 5 to 24 has rheumatic fever as a background in most instances is obvious, but it is equally obvious from both clinical and pathologic experience that the total deaths in this age group by no means represent the total deaths brought about by rheumatic fever. Indeed, Hedley [4] earlier emphasized the importance of rheumatic heart disease as a cause of death in the last four decades of life. In New York State during the year 1938 one finds from table 3 that among the estimated 5,500 deaths from rheumatic heart disease there occurred 1,494, or 28 per cent of the total, within the first three decades. If one includes only the cardiac deaths in the age group 5 to 24, the total was 1,129, or roughly 20 per cent of the total estimated as due to rheumatic carditis. If this ratio holds for the entire United States, it would seem that the total deaths from rheumatic heart disease for the year 1936 would be five times the 6,321 reported by Hedley as occurring in the age group 5 to 24 inclusive, or 31,600. If we further apply to this total the factor of 15, the average number of years that DeGraff and Lingg [10] found to elapse between the onset of rheumatic fever and fatal heart disease, we could estimate that there were about 460,000 persons in the United States whose hearts had been damaged as a result of rheumatic fever. Paul,[12] from a study of the incidence of valvular heart disease among school children, drafted men, hospital patients and insured persons, estimated that the total number of cases of rheumatic heart disease in a population of 100 million would be about 840,000; this rate applied to the present population of the United States would give about 1,100,000 cases. As this is more than double the number I have estimated from mortality rates, it seems that my estimate is probably not too large. Another check on my estimates might be derived from the annual death rate from valvular heart disease among policyholders of the Metropolitan Life Insurance Company reported by Dublin and Lotka; [13] for the year 1930 that rate was 45 per hundred thousand. This, applied to a population of 130,000,000, would give a total of 58,500 deaths a year from valvular heart disease, a figure nearly double that derived from my estimates. This multiplied by 15 would indicate almost 900,000 cases of valvular disease and if, as seems probable, higher rheumatic fever rates existed in the 1920s, the total would easily be raised to a million, for let it be emphasized that the rheumatic fever of ten to twenty years ago is having an influence on the rate of cardiac deaths today.

CLIMATIC INFLUENCES ON INCIDENCE OF RHEUMATIC HEART DISEASE

Among the factors that have received much attention in the etiology of rheumatic fever are the geographic conditions under which the disease appears to wax or wane. These are naturally important in considering public health aspects of rheumatic heart disease, for the chronic and relapsing nature of the infection furnishes an ideal setup for testing the influence of various environments, could it be confidently stated that some offered probability of arresting its progress.

A striking feature of the rheumatic infection in this latitude is the seasonal variation, with the highest incidence in late winter and spring; but when summer comes fewer new cases occur, and those with acute symptoms improve. This indicates that a tropical environment might explain the phenomenon, were similar seasonal influences not seen in a more northern area such as London, where a really hot day is rare. There, however, the low point on the incidence curve corresponds with the combination of greatest amount of sunshine, highest mean temperature and lowest moisture.[14]

The many surveys indicating the rarity of the disease in the tropics and subtropics and the lower incidence reported in our own Southern states have suggested the importance of climate to such an extent that some people think that all they require to be cured is to move to Florida or California. In view of these opinions it becomes necessary to investigate the available data more closely. The most encouraging reports were those

10. DeGraff, A. C., and Lingg, Claire: The Course of Rheumatic Heart Disease in Adults: I. Factors Pertaining to Age at Initial Infection, the Development of Cardiac Insufficiency, Duration of Life and Cause of Death, Am. Heart J. **10**: 459 (April) 1935.

11. Hedley, O. F.: Trends, Geographical and Racial Distribution of Mortality from Heart Disease Among Persons 5-24 Years of Age in the United States During Recent Years (1922-1936), Pub. Health Rep. **54**: 2271 (Dec. 29) 1939.

12. Paul, J. R.: The Epidemiology of Rheumatic Fever, American Heart Association, New York, Metropolitan Life Insurance Company, 1930.

13. Dublin, L. I., and Lotka, A. J.: Twenty-Five Years of Health Progress, New York, Metropolitan Life Insurance Company, 1937.

14. London County Council Annual Report **3**: 40 (part 2, Public Health), 1937.

of Coburn,[15] who moved a few children with chronically active rheumatic fever to Puerto Rico and noted complete subsidence of symptoms, with recurrence of active carditis when the patients had resumed their residence in New York. Jones and his co-workers [16] noted similar improvement in a group of children sent from Boston to Miami for one season, but the results were subsequently less encouraging. One might remark, parenthetically, that the climate of Miami is far from tropical and that numerous fresh respiratory infections are transported from the North to that city daily during the winter. The factor of respiratory infection is therefore not eliminated by a possibly favorable geographic site.

Several communications have appeared in recent years indicating that rheumatic fever may not be so rare in the tropics as might be implied from the reports of Tertius Clarke [17] and others. The coastal borders of southern India and Ceylon are about as tropical as any regions inhabited by man, but Fernando [18] and Stott [19] have found a fairly high incidence of rheumatic heart disease among the natives, with the same relative differences in incidence among the poor and well-to-do as is seen in New York and London. Indeed, crowding, poor housing and poor nutrition seem to play almost as important unfavorable roles in hot as in cold climates. The type of clinical manifestations of rheumatic fever under different climatic environments must be considered in judging the reports from different localities. In this country many clinicians have noted the relative infrequency and mildness of polyarthritis in the South, compared with the Northeastern Seaboard. Stott [19] emphasizes the necessity of estimating the incidence of rheumatic fever in India from the occurrence of mitral valvular disease rather than from that of migratory polyarthritis. On the other hand, the influence of climate seems to be strikingly brought out by such investigations as that of Paul and Dixon [20] among three large groups of American Indian children living in different latitudes. Even though of analogous anthropologic stock, with housing conditions not dissimilar, those living in southern Arizona had only about one tenth as much mitral valvular disease as those in Idaho and Montana.

Any large survey, then, that will throw light on the influence of climate is welcome. Hedley's [11] recent report presents an analysis of the cardiac deaths among decedents between the ages of 5 and 24 over the period 1922 to 1936 and covers the entire United States. The value of these data rests on the approximately correct assumption that most of the cardiac deaths in this age group have rheumatic fever as a basis. A perusal of these data shows the difficulty of judging correctly the influence of such a simple factor as climate, for we immediately meet the complicating factors of urbanization, race and economic status of the inhabitants; and in the state of Florida, for example, one must consider the probability that during the past two decades many cardiac invalids have migrated from less salubrious climates.

The first serious factor in the analysis of the crude figures is the relatively greater death rates among Negroes compared with white persons. For example, among the twenty cities having the highest rate in the three years 1930-1932 the Southern states include three, namely Jacksonville, Memphis and El Paso; but, when the data for these three are separated into white and colored groups, the rates for white persons fall far below that for the colored. Again, if we pick the cities of 100,000 or more with a rate of 10 or less per hundred thousand among the white population, we find that here the rate among Negroes is from two to four times as high. One may legitimately ask whether these differences are due entirely to racial factors or in part to such economic elements as poor food, housing and clothing. An interesting commentary on the relative influence of climate and economic status is furnished by the rates in Boston, 31.3, Somerville, 16, and Cambridge, 11.8 per hundred thousand, respectively, in the years 1930-1932. The climatic environment in these three contiguous Massachusetts cities is essentially the same but the economic conditions differ. The differences in the rates of deaths probably due to rheumatic heart disease in the white and colored races, respectively, is further emphasized by an analysis of Hedley's data for the Southern states during the period 1922-1929, where the rates among Negroes were two to three times that for white persons.

TABLE 4.—*Mean Annual Death Rate per Hundred Thousand from Heart Disease (Categories 90-95) in Age Groups 5-24 Years, 1930-1932* [21]

Twenty Highest Rates	Total	White	Colored
Buffalo	40.3	....	....
Jersey City	34.6	....	....
Pittsburgh	34.3	33.3	45.0
Salt Lake City	33.6	....	....
Boston	31.3	....	....
Paterson	29.8	....	....
Scranton	28.5	....	....
Denver	28.4	....	....
Spokane	28.0	....	....
New York City	28.0	27.2	45.0
Fort Wayne, Ind.	27.7	....	....
Chicago	27.2	23.8	41.6
Washington, D. C.	26.4	21.2	38.7
Springfield, Mass.	26.3	....	....
Jacksonville	26.1	13.8	45.4
Elizabeth	25.9	....	....
Philadelphia	25.7	25.1	31.2
Hartford, Conn.	25.3	....	....
El Paso	25.0	9.3	88.4
Memphis	25.0	16.3	39.7
White Rate 10 or less per 100,000			
El Paso	25.0	9.3	88.4
Houston	11.9	9.9	17.2
Fort Worth	10.6	8.6	20.9
Dallas	10.5	6.5	28.9
New Orleans	17.8	10.4	35.5
Atlanta, Ga.	20.9	8.5	42.9
Miami, Fla.	10.1	8.5	13.5
Richmond, Va.	15.0	9.2	28.2

Even considering the combined rates for white and colored, a favorable effect of the southern climate can be inferred from these tables, for when one compares the rate among white persons in the various states of the South with that for the entire population in the northernmost states, the balance is in favor of the Southern states in practically every instance. Again, comparison of the rates in the northern tier of states with those of the southernmost yield additional interesting information (table 6). The rate for Maine is lowest of any in its tier and as low as that among the white population of Virginia, Kentucky or Florida. The rate for Vermont is almost as low; while New Hampshire, situated between these two, has a distinctly

15. Coburn, A. F.: The Factor of Infection in the Rheumatic State, Williams & Wilkins Company, Baltimore, 1931.
16. Jones, T. D.; White, P. D.; Roche, C. F.; Perdue, J. J., and Ryan, H. A.: The Transportation of Rheumatic Fever Patients to a Subtropical Climate, J. A. M. A. **109**: 1308 (Oct. 16) 1937.
17. Clarke, J. T.: The Geographical Distribution of Rheumatic Fever, J. Trop. Med. & Hyg. **33**: 249 (Sept. 1) 1930.
18. Fernando, P. B.: Rheumatic Heart Disease as Met with in Hospital Practice in Ceylon, Quart. J. Med. **8**: 261 (July) 1939.
19. Stott, H.: On the Necessity of Teaching the Frequency of Rheumatic Infection in Young Indians, Indian M. Gaz. **73**: 330 (June) 1938.
20. Paul, J. R., and Dixon, G. L.: Climate and Rheumatic Heart Disease: A Survey Among American Indian School Children in Northern and Southern Localities, J. A. M. A. **108**: 2096 (June 19) 1937.

21. Tables 4, 5 and 6, material abstracted from Hedley's tables.

higher rate, possibly because of a larger industrialized population. The three northern tier states with the largest urban population, New York, Ohio and Michigan, had by far the highest rate; then in the rest of the northern tier with the exception of Montana the rate is practically the same as that of New Hampshire. Montana must be classed among the mountain states where

TABLE 5.—*Mean Annual Death Rate in Southern States per Hundred Thousand from Heart Disease (Categories 87-90) in Age Groups 5-24 Years, 1922-1929*

	Total	White	Colored
Maryland	21.2	19.7	27.5
District of Columbia	25.4	19.3	41.0
Virginia	13.7	10.8	20.7
West Virginia	11.3	....	....
North Carolina	12.4	8.8	20.0
South Carolina	15.5	8.7	22.1
Georgia (2 years)	13.0	8.3	20.2
Florida	15.0	11.4	22.5
Kentucky	11.1	10.2	20.9
Tennessee	10.7	8.9	18.8
Alabama (5 years)	12.0	7.8	19.0
Mississippi	11.0	6.9	14.8
Arkansas (3 years)	8.9	7.4	13.3
Louisiana	12.6	7.1	21.3
Oklahoma (2 years)	9.0	8.5	12.7
Texas (4 years, 1933-1936)	8.8	...	....

Hedley found the highest rate. Indeed, Utah leads all the states with a rate of nearly 35 per hundred thousand; and the Mountain states as a group with a rate of 22.6 were exceeded only by the group of Middle Atlantic states New York, New Jersey and Pennsylvania, where the rate was 27.6. As Arizona and New Mexico had distinctly the lowest rate of any mountain state, a southern latitude again appears to exert a favorable influence.

With minor variations, a trend in incidence of fatal heart disease in the age groups 5-25 has been steadily downward over the past two decades; and this tendency is in line with that noted by Atwater,[22] by Cohn [23] and by Dublin and Lotka.[13] It is interesting to see that the percentage fall has been less in those Southern states where the rate is low, such as Alabama and Mississippi; but there the high rate among Negroes did not drop in the last decade; and in the South Atlantic states, where there was an appreciable fall of the rate among the white people during this period, that among the colored was stationary or rising. It must be mentioned, however, that the fall in the death rate from heart disease in the age group 5-25 does not prove definitely that there has been a corresponding fall in the incidence of either rheumatic fever or rheumatic heart disease, because, as already mentioned, this age period comprises only a fraction of all the cardiac deaths resulting from rheumatic fever; and possibly better treatment has lengthened the life expectancy of patients with rheumatic heart disease so that the fatal outcome may not be manifest until later age periods. Such, indeed, has been the result of modern therapy in diabetes; but even if Hedley's analyses indicate no more than that, such an encouraging gain is well worth recording.

In summary, then, Hedley's data indicate that at least two environmental conditions are operative and should be considered, namely climatic and economic. The Southern states appear to furnish the most favorable environment for patients with rheumatic heart disease or at least the least favorable environment for its development, while the Middle and Northern Mountain states should probably be avoided by sufferers from this disease, if they are searching for the most beneficial climate.

22. Atwater, R. M.: Studies in the Epidemiology of Acute Rheumatic Fever and Related Diseases in the United States, Based on Mortality Statistics, Am. J. Hyg. **7**: 343 (May) 1927.
23. Cohn, A. E.: Heart Disease from the Point of View of the Public Health, Am. Heart J. **2**: 275-301 (Feb.), 386-407 (April) 1927.

SANATORIUM THERAPY OF RHEUMATIC HEART DISEASE

While the nature of rheumatic fever and rheumatic heart disease and the size of the problem have long appeared to make it amenable to public health consideration, as far as can be learned, only in London have extensive provisions been made for the care of the majority of rheumatic children. In many of our cities the school authorities have provided facilities for education, transportation and school room environment specially arranged for children with heart disease. Special cardiac outpatient departments, often supervised by local heart association specialists, attempt to furnish medical care for these children; and in a few cities there are good convalescent homes largely supported by private philanthropy, with private physicians in attendance. All of these efforts, however, have apparently only scratched the surface. It is fortunate, therefore, that we have had one large scale example of how the problem might be attacked; and there are also some data indicating favorable results from this experiment, which is being conducted in London.

The London County Council's Rheumatism Scheme has been slowly developed since 1926.[24] Fundamentally it is based on two theses: first, that rheumatic fever is a chronic infection and hence its victims should receive adequate chronic treatment; and, second, that the relapsing nature of rheumatic fever and the consequent heart disease demand supervision over many years. It is a cooperative effort on the part of the school and health authorities, which have enlisted under their supervision the public and private institutions already organized for the care of rheumatic children; and in addition there have been built, outside of London, special units containing a total of 900 beds for hospitalizing all cases of rheumatic fever, chorea or active rheumatic heart disease in school children under

TABLE 6.—*Comparison of Mean Annual Death Rate per Hundred Thousand from Heart Disease (Categories 87-90) in Age Groups 5-24 Years, 1922-1929, in Northernmost and Southernmost Tiers of States*

Northern Tier		Southern Tier		
Maine	10.5	Florida	11.4	White
New Hampshire	14.2	Alabama	7.8	White
Vermont	11.9	Mississippi	6.9	White
New York	29.7	Louisiana	7.1	White
Ohio	18.0	Texas	8.5+	Total
Michigan	20.7	New Mexico	16.0	Total
Wisconsin	14.4	Arizona	14.0	Total
Minnesota	14.7	California	16.0	Total
North Dakota	12.8			
Montana	19.5			
Washington	15.4			
New York (total) 29.7		New Jersey 28.9		Pennsylvania 24.9

16 years of age for at least six months. This has required a minimum of one bed to 550 school children.[25] The working of the scheme is best illustrated in the chart of the organization. The center is the rheumatism section in charge of a full-time medical officer with an adequate staff; through this section all applications for admission to the special hospital units pass. There are two types of units, one for active cases and the other for convalescent children who have recovered from

24. Thornton, C. E.: The London Scheme for the Treatment and Supervision of Juvenile Rheumatism, Acta rheumatol. **9**: 10 (May) 1937.
25. Thornton, C. E.: Personal communication to the author.

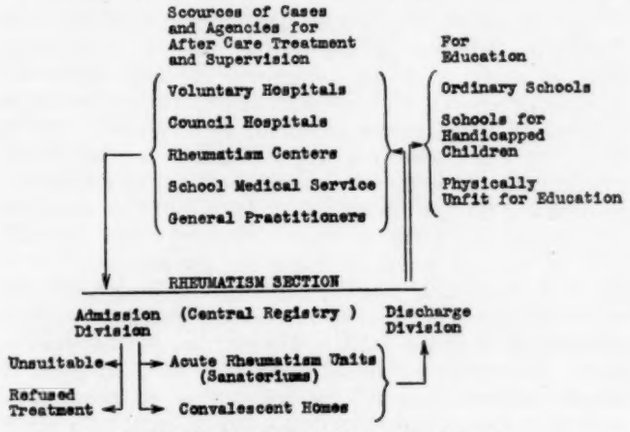
recent attacks. On discharge from these hospital units the patients again pass through the rheumatism section, which assigns the child to the educational category its physical state requires and also to the proper medical supervisory authorities. In this rheumatism section there is a register of each child reported as suffering or having suffered from rheumatism and this is used to supervise and record his treatment until he is 16; and for those patients who have received institutional care under the scheme there are more complete records which are available for reference until the patient attains the age of 18. Physicians in supervisory centers situated either in the schools, in private hospitals or in outpatient clinics supported by the scheme examine these patients often enough to detect recrudescence of rheumatic fever even though of slight degree; and in such instances the patient is referred again to the proper institution for treatment. These institutions are essentially hospitals or sanatoriums with both medical and educational staffs, for it is realized that suitable education and special training of these patients are important elements in their treatment. The individual hospital units have all physical provisions necessary for good medical care, including outdoor treatment in bed when that is advisable. The home conditions of all active cases are investigated, and where obviously inadequate or unfavorable, a report is submitted to proper authorities with the object of having these families better housed.

Physicians who have followed rheumatic children for the past fifteen or twenty years feel that the expense of the scheme has been justified by the statistical results. In 1926, for example, 2 per cent of the school children of London were suffering from acquired heart disease, while in 1936 the incidence had fallen to 0.8 per cent. Furthermore, the number of children of school age whose chronic cardiac crippling was of such severity as to require care in special educational units during a four year period has dropped steadily as follows: 1934, 320; 1935, 232; 1936, 153; 1937, 114.[26]

In urging the importance of providing similar facilities for the chronic care of patients with rheumatic heart disease, one often meets the objection that we cannot judge accurately the benefits of sanatorium therapy because we have no large series of untreated patients for comparison. One might reply that practically all studies and statistics concerning the life history of rheumatic heart disease deal largely with patients who fall naturally into such a control group because they have had relatively little institutional treatment. On the other hand, even admitting the desirability of a simultaneously observed noninstitutionalized control group made up of rheumatic children of similar age and severity of carditis, it appears probable that such a striking diminution in the incidence of both rheumatic valvular disease and of crippling carditis as has been observed in London might properly be attributed to the measures so extensively provided for prolonged treatment of children with active or recent rheumatic fever.

PROBABLE SANATORIUM REQUIREMENTS FOR RHEUMATIC CHILDREN IN NEW YORK CITY

As already noted, London is the only large city which has attempted to provide care for rheumatic children on an extensive scale; and as the scheme there elaborated has been slowly developed, it probably rests on a sound basis. Doubtless the present war has disrupted its working seriously, but it has been operative long enough to serve as a model. It therefore might be profitable to compare the facilities in New York for meeting a similar problem. If provision for hospitalization should be made at the same rate as that existing for the London school population under 16 years of age, i. e. one bed for 550 children, 1,760 beds would be needed. In 1934, 2,181 children under 14 years of age with heart disease were discharged from the hospitals of New York City; among them 1,441, or 66 per cent, were kept in the wards less than one month and another 414, or 19 per cent, were in the wards between thirty-one and sixty days.[27] As the majority of these 1,855 children were doubtless suffering from active rheumatic carditis, it is obvious that the case load here requiring the type of treatment furnished in London was as large as existed in that



London County Council Rheumatism Scheme.

city. Moreover, the large group of children with simple rheumatic fever or chorea were not included, nor were those seen only in outpatient clinics enumerated. For the special care of more than 2,000 children there were 187 beds, but in only one of the institutions, Irvington House, were physicians in residence and adequate facilities available for the complete study of infectious and cardiac activity. Subsequently the St. Francis Sanatorium for Cardiac Children has been established at Roslyn, Long Island, with recent plans for enlarging its capacity to 125 beds. Therefore about 300 beds are now available to meet a situation probably demanding from three to five times as many for children alone. The New York Heart Association cardiac clinics are probably as well organized as the London supervisory centers, and in many of them the technic for following the natural history of rheumatic heart disease is much better. New York City has special school classes for physically handicapped cardiac children and provisions for their transportation. What we lack is a central rheumatism section comparable to that in London and the provision for adequate sanatorium care. A central registry for these patients is obviously desirable, for only by analysis of records of rheumatic patients such as would be compiled by such a system will it eventually be possible to determine the relative efficacy of different treatments. The New York Heart Association has not been unmindful of the importance of compiling such records, and its Research Committee has many thousand under accumulation and analysis. But the effective study of such data should not rest on the efforts and

26. London County Council Annual Report 3: 44 (part 2, Public Health), 1937.

27. Facilities in New York City for the Care of Patients with Heart Diseases, New York Heart Association, 1936, p. 16, table 5.

enthusiasm of a small group, for in the case of a chronic disease such as that presented in the rheumatic heart the problem is longer than that of the life of any single individual or group; hence an adequately financed, permanent, supervisory and statistical organization should be provided which will have as its object the long-range study of the adequacy of prophylaxis and therapeusis. A registry of patients with tuberculosis by health authorities has been feasible and useful. Numerically the problem of the rheumatic child and adolescent is as great as that of the tuberculous youth of this city. The permanent arrest of the active infection in the heart of the rheumatic child would seem to offer as great a chance for a useful economic life as the arrest of tuberculous infection of the lung. What appear to be needed are adequate facilities for establishing that arrest at the earliest possible moment.

PROPER CARE IN DIFFERENT PHASES OF DISEASE

The problem of the proper care of rheumatic children differs in different phases of the disease. Obviously most of them with the symptoms of acute arthritis, carditis or chorea will be sent to general or pediatric hospitals if they are not cared for in their own homes. While they are acutely ill the indications are relatively simple, and the ordinary general hospital is willing to assume the burden; but as they pass into the subacute or chronic stage the problem becomes more difficult with at present scant facilities for its solution. It is my firm conviction that at this stage the average child would be best treated in an institution where the special indications imposed by his disease can be adequately met. The retaining of a rheumatic child in general wards subjects him to greater danger of reinfection with hemolytic streptococci than would exist in a ward where the serious implications of such reinfection are recognized and measures are instituted for their prevention. The educational, recreational and psychologic requirements of these chronically bedridden and convalescent patients can best be met in special groups than among patients who are more acutely ill and undergoing more rapid recovery; their careful and gradual restoration to normal activity will be more effectively supervised and their response to exercise more easily noted than where these activities have less influence on the ultimate outcome. Convalescence from rheumatic carditis should be chronic; and to make a child in this condition compare the slowness of his recovery with that of a convalescent from pneumonia or appendicitis is to submit his psyche to a strain that may have permanent implications.

The low grade and chronic nature of many relapses, and often of first attacks, emphasizes the necessity of providing adequate care from the time of their detection, for it is practically impossible to have a patient with this type of low grade chronic disease admitted to the wards of general hospitals. Most children treated in outpatient clinics because of broken cardiac compensation are suffering from active rheumatic carditis. At present the only care possible for the majority of them is such rest as can be provided in their own homes under the unhygienic conditions that have favored the rheumatic relapse. Suffering from inflamed hearts and blood vessels, they are transported to the clinics in public conveyances, and both here and in the waiting rooms of the clinics they are often subjected to reinfection with types of streptococci against which they have not developed immunity. Is it any wonder that in so many cases the cardiac crippling is progressive? This type of patient should be treated in the same manner as the one who has been transferred from general hospital wards after the acute illness, for their therapeutic requirements are similar.

An ideal sanatorium would provide for both the patient with active rheumatic carditis and the one in the convalescent stages, much as the tuberculosis sanatoriums contain both an infirmary and cottages or wards for prolonged convalescence. The average convalescent home for cardiac patients has evolved from the general convalescent home in charge of nurses, and with a minimum of resident medical supervision. A patient after recovering from the subacute inflammation in his heart would be better under the watchful eyes of physicians who understand the nature of his malady, even though his immediate care in this stage is largely in the hands of nurses, educators and child guidance specialists who should certainly be acquainted with his physical as well as his intellectual needs, just as the physicians and nurses should understand his particular psychologic problems.

The need for supervision of the patient on discharge from these special institutions brings up a number of questions in which the factors of familial and domiciliary environment and heredity in the etiology of rheumatic fever are at present inexplicably interwoven. Recent careful statistical analysis of rheumatic families made by Wilson and Schweitzer [28] and by Read and her co-workers [29] suggests that there is a hereditary factor at play in many instances. On the other hand, careful studies of rheumatic children's families by Paul and Salinger [30] suggest either that rheumatic fever may be a special manifestation of widespread respiratory infections or that these infections, suffered by most members of a family, set off the rheumatic explosion in a specially susceptible subject. Moreover, Paul's [31] observations indicate that rheumatic manifestations are much more frequent in children than in adults subjected to the same respiratory infections which have spread through families. The status of a rheumatic patient in a family may be contrasted with that of a person with active tuberculosis: In the latter instance, the patient is a source of danger because he is a disseminator of tubercle bacilli; on the other hand, while the rheumatic patient may play a comparable role in respect to an etiologic agent of rheumatic fever, a greater danger seems to exist in the possibility that certain nonspecific respiratory infections spreading through the family will light up a new bout of rheumatic fever. In one illness the patient threatens his companions, in the other his companions threaten him.

Such peculiar susceptibility explains in part the frequency with which rheumatic relapses are observed in children who move from the favorable environments of a convalescent home to their own home. Indeed, from several aspects this move should be carefully prepared for and supervised. It should probably be postponed until after the active rheumatic fever season

28. Wilson, M. G., and Schweitzer, M.D.: Rheumatic Fever as a Familial Disease: Environment, Communicability and Heredity in Their Relation to the Observed Familial Incidence of the Disease, J. Clin. Investigation **16**: 555 (July) 1937.

29. Read, Frances E. M.; Ciocco, Antonio, and Taussig, Helen B.: The Frequency of Rheumatic Manifestations Among the Siblings, Parents, Uncles, Aunts and Grandparents of Rheumatic and Control Patients, Am. J. Hyg. **27**: 719 (May) 1938. Gauld, R. L.; Ciocco, Antonio, and Read, Frances E. M.: Further Observations on the Occurrence of Rheumatic Manifestations in the Families of Rheumatic Patients, J. Clin. Investigation **18**: 213 (March) 1939. Gauld, R. L., and Read, Frances E. M.: Studies of Rheumatic Disease: III. Familial Association and Aggregation in Rheumatic Disease, ibid. **19**: 393 (March) 1940.

30. Paul, J. R., and Salinger, Robert: The Spread of Rheumatic Fever Through Families, J. Clin. Investigation **10**: 33 (April) 1931.

31. Paul, J. R.: Age Susceptibility to Familial Infection in Rheumatic Fever, J. Clin. Investigation **10**: 53 (April) 1931.

has passed and should not occur when respiratory infections are rife in the family. Indeed, the home conditions may be so unfavorable as to indicate prolonged residence in a suitable foster home. The benefit of long foster home care compared with that in special institutions is now being studied by a special committee of the New York Heart Association.[32] Moreover, the psychologic adjustments imposed by the disease and by transfer from an institution or foster home to his own family environment would also be better supervised by properly trained persons than to leave them simply to chance. These considerations indicate that an efficient public health program would provide for investigating the families of most rheumatic children. If the housing conditions were obviously at fault, attempts would be made to have better physical environment provided in the newer and more hygienic houses now being built. If some other member of the family was acting as an obvious nidus of repeated respiratory infections, it would be important to treat him or else remove the rheumatic subject to less precarious surroundings. All the members of the family should be instructed concerning the dangers to the patient of respiratory infections and the means for inhibiting their spread.

Infectious elements may eventually be controlled by employing chemotherapeutic measures such as those tested by Coburn and Moore.[33] Obviously the administration of sulfanilamide or its derivatives to large groups of patients must be carefully supervised in order to reduce to the lowest degree the incidence of unpleasant or dangerous side actions. Parenthetically, it should be again emphasized that this drug has no curative influence on rheumatic fever but, on the contrary, often increases the severity of the rheumatic manifestations;[34] hence no drugs or other therapeutic measures now in our possession relieve us of the necessity of providing suitable institutional facilities for the care of rheumatic children.

Naturally, the suggested plan for the care of youthful rheumatic patients does not cover all the requirements imposed by rheumatic fever, but it does seem as though effective treatment during this age period might lessen the dangers of serious heart disease later in life and prolong the useful days of those who have been affected as children. Progressive cardiac crippling in the third and fourth decades is often the result of repeated or continuous rheumatic insults to the heart and blood vessels; hence in later life it is probable that prolonged rest and other measures directed toward increasing the patient's resistance to infection are indicated. To expect the average general hospital to assume this burden seems unreasonable; moreover, in suitably arranged sanatoriums these patients could be more effectively treated for approximately half the cost daily. The apparently favorable influence of Southern latitudes suggests the desirability of studying the treatment of some of the more intractable cases in institutions situated properly in the South.

We are too prone to demand satisfactory answers concerning etiology, immunotherapy and prophylaxis of rheumatic fever before attempting to provide facilities which seem to have a rational basis. It is well to recall that Dr. Trudeau's therapeutic experiments were started before the discovery of the tubercle bacillus and that our present day treatment of the tuberculous patient is based on proper rest, diet and regulated exercise rather than on specific immunotherapy derived from our knowledge of the tubercle bacillus. The fact that many patients have recovered from tuberculosis without undergoing a rest cure does not relieve us of the responsibility of advising and providing for such cures; neither does the fatal outcome in many well treated cases relieve us of that responsibility. The necessity for continued investigation is still urgent in both diseases.

While many problems concerning rheumatic fever, rheumatic carditis and vasculitis remain unanswered, enough is known to warrant the institution of the measures suggested. The American Heart Association with its constituent membership of hundreds of cardiac clinics provides machinery for carrying out a part of the program. The United States Public Health Service is becoming interested to the extent of fostering both laboratory and statistical investigations. Chicago has made rheumatic fever a reportable disease. The New York Heart Association has evolved a most complete system of classification of heart diseases and established criteria on which efficient diagnostic data may be based; and this has been adopted by the American Heart Association.[35] The United States Bureau of the Census has agreed to separate rheumatic complications as they appear to affect cardiac fatalities during the years 1937, 1938 and 1939.[36] What is really needed in vital statistics is an etiologic diagnosis in all fatal cases of heart disease in addition to the anatomic diagnosis now in vogue, and with a separate category for the unknown. In general, this rubric unknown can be applied to the entire categories 90 to 95 of the International List of Causes of Death, and only by applying probability figures to the various age groups can we obtain indexes which are probably valid if not strictly accurate. But why wait until death until we try to classify? The size of the problem and the necessity for providing proper care for the large group of patients with rheumatic heart disease would be more quickly learned by making rheumatic fever and rheumatic heart disease reportable. By and large the long-range effectiveness of our therapeutic and prophylactic measures will be measurable only if we have these data.[37]

The seriousness of rheumatic fever to the individual and to large groups of individuals needs no arguing, but there has been less emphasis on the number of patients who have recovered from an acute attack without heart involvement and on the possibility of leading a long, useful and happy life even with a certain degree of distortion of the heart valves, if the patient has permanently subdued the rheumatic infection. It would therefore seem only the part of wisdom for society to provide the machinery whereby more patients may be moved to this more fortunate class, even though rheumatic fever still exists. This would be the objective of an efficient health program.

32. These foster homes are provided and supervised by the Speedwell Society.

33. Coburn, A. F., and Moore, L. V.: The Prophylactic Use of Sulfanilamide on Rheumatic Subjects, Proc. Third Internat. Cong. Microbiol., 1939, p. 596. Internat. Clin., 1940, to be published. (Dr. Coburn allowed me to consult the manuscript.)

34. Swift, H. F.; Moen, J. K., and Hirst, G. K.: The Action of Sulfanilamide in Rheumatic Fever, J. A. M. A. **110:** 426 (Feb. 5) 1938.

35. Nomenclature and Criteria for Diagnosis of Diseases of the Heart, Criteria Committee of the New York Heart Association, New York, J. J. Little & Ives Company, 1939.

36. Dunn, H. L., and Hedley, O. F.: Statistics on Deaths from Rheumatic Heart Disease, J. A. M. A. **110:** 1413 (April 30) 1938.

37. The aid extended by the Children's Bureau of the Department of Labor to various states for the care of rheumatic children should provide facilities for studying some of the problems here discussed. Because of the chronic nature of rheumatic heart disease, the final results of therapeutic measures established now will be measurable only after fifteen to twenty-five years. Vital statisticians should therefore be quickly furnished with reliable figures with which to begin constructing valid numerical criteria applicable to a long term analysis.

SUMMARY

The size of the problem of rheumatic heart disease, from the standpoint of public health, indicates the desirability of widely extending the facilities for meeting the situation. The long period usually consumed in the evolution of rheumatic heart disease offers opportunity for interfering with that evolution at various times. Those unfavorable factors classified as economic are subject to improvement. Favorable climatic factors may be utilized. Because functional trauma of cardiac tissues harboring rheumatic inflammation probably increases the damage to these tissues, prolonged rest for such actively diseased structures is requisite and should be provided on a scale commensurate with the size of the problem. The role of hemolytic streptococcus infections in initiating the disease rheumatic fever and in inciting relapses indicates the importance of protecting these patients from such infections.[38] When these elements in a public health program are clearly recognized, there can be little doubt of its establishment.

CONTROL OF DIABETES MELLITUS

RELATION TO THE HEALING OF CLEAN AND INFECTED WOUNDS AND TO INCIDENCE OF INFECTION IN CLEAN WOUNDS

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There continues to be a great deal of anxiety concerning the healing of wounds in cases of diabetes mellitus. Before the discovery of insulin a rising blood sugar level with increasing glycosuria was an ominous sign after a surgical operation or if the patient had an infected wound. The wounds of those who did not succumb to acidosis were likely to heal very slowly or become infected, and existing infection tended to spread. Since the advent of insulin, acidosis has been preventable and has ceased to be formidable. The other complications, however, continue to be menacing.

The idea is prevalent that such complications occur more frequently among patients with a high blood sugar level and glycosuria than among those who have a normal blood sugar level and no glycosuria. Study of the literature reveals that the methods advocated for the control of diabetes after surgical operations, or when the patient has an infected wound, vary considerably. Of the two methods which are most widely used, one [1] aims to maintain the sugar content of the blood at a normal level and prevent glycosuria; the other [2] is to examine the urine every three to six hours and adjust the dose of insulin according to the degree of glycosuria. Those who advocate this procedure do not specify at what level the blood sugar should be maintained or the amount of glycosuria which is permissible, but they intimate that the urine should be kept approximately sugar free. A few authors do not favor such strict control. Some of them [3] state that a slight elevation of the blood sugar level (to 180 mg. per hundred cubic centimeters) with a moderate degree of glycosuria is not harmful during the first few postoperative days, provided both decrease rapidly, whereas others [4] advise that ketosis be avoided but ignore the blood sugar level and degree of glycosuria.

TABLE 1.—*Incidence of Delayed Healing of Wounds in Relation to the Blood Sugar Level in Cases of Diabetes Mellitus*

Blood Sugar Level, Mg. per 100 Cc.	Healing Time: Normal	Healing Time: Prolonged	
	No. of Cases	No. of Cases	Per Cent
Below 200	127	76	37.43
Above 200	101	24	19.20

No one, as far as we know, has shown that the healing of clean or infected wounds is delayed or that infection develops in clean wounds more frequently in diabetic patients with hyperglycemia and glycosuria than in those with normal blood sugar levels and no glycosuria. It is for this reason that the present study was undertaken.

The records of 324 diabetic patients who had clean or infected wounds and were receiving a small or moderate amount of carbohydrate were analyzed in order to ascertain the frequency of delayed healing of wounds in relation to the height of the blood sugar and degree of glycosuria. The incidence was compared to that in a series of 158 nondiabetic patients of the same age and sex who had comparable lesions. In addition, in a series of thirty-five diabetic patients who had either clean or infected wounds the blood sugar level was kept between 250 and 368 mg. per hundred cubic centimeters and the twenty-four hour urinary excretion of sugar between 50 and 150 Gm. by the daily administration of from 300 to 500 Gm. of what was actually, or potentially, dextrose. Furthermore, the incidence of infection in 323 clean

TABLE 2.—*Effect on the Healing Time of Wounds of Maintaining the Blood Sugar Level Above 250 Mg. per Hundred Cubic Centimeters in Cases of Diabetes Mellitus*

Blood Sugar Level, Mg. per 100 Cc.	Healing Time: Normal	Healing Time: Prolonged	
	No. of Cases	No. of Cases	Per Cent
Below 200	105	53	33.54
Above 200	91	20	18.01
Above 250	30	5	14.29

38. The importance of these etiologic elements is discussed in the first lecture of this series, Medicine, to be published.

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Read before the Section on Practice of Medicine at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Articles describing first method:
Terry, A. H.: Diabetic Regimen in Surgical Cases, New York J. Med. **35**: 159-160 (Feb. 15) 1935.
Allan, F. N.: Surgery and Diabetes, S. Clin. North America **13**: 719-725 (May) 1933.
Murray, Gordon: Diabetic Infection and Gangrene, Canad. M. A. J. **41**: 246-250 (Sept.) 1939.
Fowler, A. F.; Bensley, E. H., and Rabinowitch, I. M.: Control of Diabetes Mellitus with Protamine Zinc Insulin in Surgery, ibid. **36**: 561-568 (June) 1937.
Gurd, F. B.: Postoperative Use of Insulin in the Nondiabetic, Ann. Surg. **106**: 761-769 (Oct.) 1937
Duncan, G. G.: The Treatment of Diabetes Mellitus During the Course of Acute Infection and Surgical Complications, Internat. Clin. **2**: 31-43 (June) 1939.
Nadler, W. H.: Surgery in the Diabetic Patient, Surg., Gynec. & Obst. **68**: 256-268 (May) 1939.

2. Articles describing second method:
Joslin, E. P.; Root, Howard F.; White, Priscilla, and Marble, Alexander: Treatment of Diabetes Mellitus, ed. 6, Philadelphia, Lea & Febiger, 1937, p. 532.
Ralli, Elaine P., and Standard, Samuel: The Care of the Surgical Diabetic, Surg., Gynec. & Obst. **58**: 228-232 (Feb.) 1934.
Hunter, John T., in discussion on Surgery in Diabetic Patients, Proc. Roy. Soc. Med. **32**: 999-1014 (June) 1939.

3. McKittrick, L. S.: Surgical Procedures in the Presence of Diabetes Mellitus, Surg., Gynec. & Obst. **68**: 508-518 (Feb.) 1939.

4. Biloon, Solomon; Harris, M. M., and Ringer, A. I.: Infection and Diabetes, M. Clin. North America **12**: 835-846 (Nov.) 1928. Hinsworth, H. P., in discussion on Surgery in Diabetic Patients, Proc. Roy. Soc. Med. **32**: 999-1014 (June) 1939.

operative wounds in cases of diabetes mellitus was ascertained. In the endeavor to decide whether the healing time has been normal or prolonged, each patient's record was studied by all three authors independently. The patients were divided into two groups, according to the blood sugar level and degree of glycosuria. Those whose blood sugar values were consistently below 200 mg. per hundred cubic centimeters with slight or no glycosuria were placed in one group, and those whose blood sugar levels were consistently above 200 mg. per hundred cubic centimeters with moderate to extreme glycosuria were placed in the other. In both groups the patients were classified according to the adequacy or inadequacy of the blood supply to the wound-bearing area. The blood supply to such areas in the head, neck, trunk and upper extremities was regarded as good in all cases. Arbitrarily, unless there was some statement in the record to the contrary the supply of blood to the lower extremities was regarded as adequate in all patients less than 40 years of age and as inadequate in all who were more than 40 years old. The patients were divided still further, depending on whether their wounds were clean or infected.

TABLE 3.—*Incidence of Delayed Healing of Wounds in the Diabetic and the Nondiabetic, of the Same Age and Sex, Who Had Comparable Lesions*

	Healing Time		
	Normal	Prolonged	
	No. of Cases	No. of Cases	Per Cent
Diabetic	228	100	29.58
Nondiabetic	118	40	25.31

TABLE 4.—*Incidence of Delayed Healing of Wounds in Relation to the Blood Supply of the Wound-Bearing Area in Patients With, and Without, Diabetes Mellitus*

	Healing Time		
	Normal	Prolonged	
	No. of Cases	No. of Cases	Per Cent
Good Blood Supply			
Diabetic	163	22	11.89
Nondiabetic	80	9	10.11
Poor Blood Supply			
Diabetic	65	78	54.54
Nondiabetic	38	31	44.92

RESULTS AND COMMENTS

Table 1 shows that delayed healing of wounds did not occur as frequently in the patients with the higher blood sugar levels and greater degree of glycosuria as it did in those with lower blood sugar values. These observations do not support the prevalent idea that hyperglycemia and glycosuria hinder the healing of wounds in cases of diabetes mellitus. The data become even more impressive when it is pointed out that a vigorous but unsuccessful attempt was made to reduce the hyperglycemia in the more severe cases of diabetes. Furthermore the fact that maintenance of the blood sugar level above 250 mg. per hundred cubic centimeters had no deleterious effect on the healing time of wounds (table 2) substantiates the contention that hyperglycemia and glycosuria are not to be regarded as important factors.

The foregoing observations raise the following question: How much more frequently is the healing of wounds delayed in patients with diabetes mellitus than in nondiabetic patients of the same age and sex with comparable lesions? This question is answered in table 3, which shows that the diabetic patient's chance of having delayed healing is approximately 4 per cent greater.

TABLE 5.—*Relation of Infection to the Incidence of Delayed Healing of Wounds in Patients With, and Without, Diabetes Mellitus*

	Healing Time		
	Normal	Prolonged	
	No. of Cases	No. of Cases	Per Cent
Clean Wounds			
Diabetic	159	43	21.28
Nondiabetic	99	14	12.39
Infected Wounds			
Diabetic	69	67	49.26
Nondiabetic	19	26	57.77

If this is true there are several possible factors which must be considered. First there is the question of the utilization of dextrose. In cases in which the dextrose intake is kept constant and the hyperglycemia and glycosuria tend to increase, the diabetes is growing worse and the patient's ability to utilize dextrose is decreasing. Under such circumstances, delay in the healing of wounds may be erroneously attributed to the hyperglycemia and glycosuria when, as a matter of fact, the patient's inability to utilize a sufficient amount of dextrose is a more likely factor. Except for the first few days after their surgical operations, our nondiabetic patients utilized from 300 to 350 Gm. of dextrose daily. On the other hand, our diabetic patients, except the thirty-five who were receiving very large amounts of dextrose, utilized only 100 to 170 Gm. Can the greater incidence of delayed healing of wounds in diabetes mellitus be explained by this lower utilization of dextrose? We cannot answer this question at present. All our patients used enough dextrose to escape ketosis, but it is possible that the avoidance of ketosis alone is not sufficient to prevent delay in the healing of wounds.

TABLE 6.—*Relation of Various Factors to the Incidence of Delayed Healing of Wounds in Patients With, and Without, Diabetes Mellitus*

	Wound					
	Clean Healing			Infected Healing		
	Normal	Delayed		Normal	Delayed	
Blood Sugar Level, Mg. per 100 Cc.	No. of Cases	No. of Cases	Per Cent	No. of Cases	No. of Cases	Per Cent
Good Blood Supply						
Below 200	71	4	5.3	14	11	44.00
Above 200	56	2	3.4	22	5	18.50
Above 250	15	0	0.0	10	2	16.60
Nondiabetic	72	2	2.7	8	7	46.60
Poor Blood Supply						
Below 200	22	23	51.10	20	38	65.50
Above 200	10	4	28.50	13	13	50.00
Above 250	0	0	0.0	5	3	37.50
Nondiabetic	27	12	30.70	11	19	63.30

It is generally agreed that patients with diabetes mellitus tend to develop arteriosclerosis earlier and to

a greater degree than nondiabetic persons. If this is true it could account for the greater frequency of delayed healing in cases of diabetes. Table 4 shows that the incidence of delayed healing of wounds in areas which were well supplied with blood was no greater among the diabetic than among the nondiabetic but when the wound-bearing area was poorly supplied with blood the incidence was higher among the diabetic. It is possible, therefore, that arteriosclerosis may be a factor.

Another possibility which must be considered is wound infection, but table 5 shows that diabetes did not interfere with the healing of infected wounds. In cases of diabetes it is the associated arteriosclerosis which accounts for the higher incidence of delayed healing of uninfected wounds. The relation of various factors to

TABLE 7.—*Incidence of Infection in Clean Operative Wounds in Relation to the Blood Sugar Level in Cases of Diabetes Mellitus*

	Wounds		
	Originally Clean	Became Infected	
Blood Sugar Level, Mg. per 100 Cc.	No. of Cases	No. of Cases	Per Cent
Below 200	191	39	20.42
Above 200	132	17	12.88

TABLE 8.—*Relation of Blood Supply and Blood Sugar Levels to the Incidence of Infection of Clean Operative Wounds in Cases of Diabetes Mellitus*

	Wounds		
	Originally Clean	Became Infected	
Blood Sugar Level, Mg. per 100 Cc.	No. of Cases	No. of Cases	Per Cent
Good Blood Supply			
Below 200	88	15	17.04
Above 200	91	5	5.59
Total	179	20	11.17
Poor Blood Supply			
Below 200	103	24	23.30
Above 200	41	12	29.27
Totals	144	36	25.00

the incidence of delayed healing of wounds in patients with and without diabetes mellitus is shown in table 6. It is to be noted that diabetes had no deleterious effect on the healing of clean or infected wounds when the wound-bearing area was well supplied with blood.

The possibility that wounds are more likely to become infected in cases of diabetes than among the nondiabetic is another source of constant anxiety. It is generally believed that the incidence of wound infection is directly proportional to the height of the blood sugar level and the degree of glycosuria. The incidence of development of infection in clean operative wounds in relation to the blood sugar level in our cases of diabetes mellitus is shown in table 7. It will be seen that the wounds of the patients with the higher blood sugar levels became infected less frequently than those of the patients with the lower levels. These observations do not substantiate the popular opinion that high blood sugar levels of patients with diabetes mellitus tend to promote the development of infection. The presence of arteriosclerosis, however, increases the incidence of infection regardless of the blood sugar level and degree of glycosuria (table 8).

We do not wish to insinuate that the blood sugar level and degree of glycosuria should be neglected, for, if they were, it is obvious that we would have no accurate conception of the severity of the disease and would be unable to control it intelligently.

SUMMARY

In 324 cases of diabetes mellitus, the relation of the incidence of delayed healing of clean and infected wounds to the height of the blood sugar level and degree of glycosuria was studied.

In thirty-five cases of diabetes mellitus, the effect on the healing time of wounds of maintaining an unusually high blood sugar level and extreme degree of glycosuria was ascertained.

The incidence of delayed healing of wounds of 324 diabetic patients was compared with that in 158 nondiabetic persons of the same age and sex who had comparable lesions.

The relation of the blood sugar level and degree of glycosuria to the frequency with which infection developed in 323 originally clean operative wounds in cases of diabetes mellitus was ascertained.

As a result of our observations, we conclude that there is no relationship between the height of the blood sugar level and degree of glycosuria and the incidence of delayed healing of wounds or of infection in originally clean wounds in cases of diabetes mellitus. Delayed healing of wounds occurs approximately 4 per cent more frequently among the diabetic than among the nondiabetic of the same age and sex. The lower utilization of dextrose and the greater degree of arteriosclerosis are possible causes for this greater incidence.

ABSTRACT OF DISCUSSION

DR. ELLIOTT P. JOSLIN, Boston: All my life I have tried to treat diabetes just as aggressively as I could, and as I watched the cases over a series of years it has seemed as if the patients did better and better. Therefore it astonishes me somewhat to hear that one can get better results with the healing of wounds with high blood sugars than with low, with the abnormal than with the normal. I confess that I cannot furnish data to combat the authors' thesis, but before accepting it and changing a life's principle to treat diabetes just as aggressively as possible I would wish in the published article that the authors would give us more data relating to their observations. First, I am curious to know whether the blood sugars were fasting or taken after a meal. I would be interested to know whether the blood sugars were blood sugars on diets which were low or high in carbohydrate and calories. I would also like to know about the dosage of insulin and whether the patients were under treatment with it throughout the studies. Then too I cannot accept the classification of adequacy of the circulation of the extremities by a 40 year age limit. How many of the patients recovered? And in which group was the percentage of recoveries the highest? I cannot give information directly combating the paper but I would refer to an article of Dr. L. S. McKittrick (*Arch. Surg.* **40**:352 [Feb.] 1940), of about a thousand operations in our series of patients, in which he showed that the results of the treatment of our surgical patients has been steadily improving, and I know that this has gone hand in hand with a more and more rigorous treatment of the diabetes. Whenever we hear statements which are a little different from those with which we have grown up, we should be very open minded. I am open minded and shall watch in the future still more to see whether patients do better in those clinics where higher blood sugars than are normal are countenanced than in those where medical supervision is more orthodox. It is difficult for me to believe

that the nearer my patient is kept to the condition of a normal individual it will do him harm; I felt that it did him good.

DR. ROY D. MCCLURE, Detroit: Like Dr. Joslin, I had always felt that an attempt should be made to reduce the blood sugar level before operation. The authors have been careful to state that this study should not cause any relaxation with regard to the preoperative and postoperative care of the diabetic surgical patient. Other factors present in the diabetic as well as in the nondiabetic patient are of undoubted significance in wound healing. Arteriosclerosis is well emphasized in the authors' tables. Acidosis, indicative of lack of dextrose utilization, is ominous. The untreated or malnourished person with diabetes may be deficient in vitamin C and plasma proteins, which appear to be important in wound healing. Fifty cases of wound disruption were recently studied by Dr. L. S. Fallis at the Henry Ford Hospital (*Surgery* **1**:523 [April] 1937). Two of these patients, both women in their fifties convalescing from pelvic operations, had diabetes. The postoperative blood sugar of one patient was 192 and of the other 135. Wound disruption occurred despite adequate control of the diabetes. The first patient recovered after secondary suture. Obviously the second patient should have been treated conservatively by packing and strapping for she died shortly after an ill advised secondary wound suture. With our present practice of maintaining proper vitamin C and protein levels in the blood, such disruptions might not have occurred. The value of a high type of medical management has long been obvious. In a recent report from Bellevue Hospital (Standard, Samuel; Brandaleone, Harold, and Ralli, Elaine P.: Surgical Results in the Treated and Untreated Diabetic Patient, THE JOURNAL, Feb. 26, 1938, p. 627) the mortality from all types of operations was increased threefold in a group of nonclinic patients who had not been followed preoperatively. Following operation for complications of diabetes such as amputations and drainage of abscesses the postoperative course in my experience has not been as good as in the nondiabetic. But for elective surgery, if the diabetic patient has the advantage of adequate control of the diabetes and the maintenance of satisfactory protein, mineral, vitamin and water balance level the wound should heal as well as a comparable one in a nondiabetic patient.

DR. JAMES A. GREENE, Iowa City: It was not our purpose to discuss all the factors that are concerned in the healing of wounds. The purpose of our investigation, as we have stated, was to ascertain whether or not hyperglycemia and glycosuria were important factors in the healing of wounds in patients with diabetes mellitus. I think that delayed healing of wounds has been attributed frequently to the presence of hyperglycemia and glycosuria when as a matter of fact too much suture material has been employed or the tissues have been traumatized excessively. We do not advocate that a patient's diabetes should be neglected, and we made a statement to that effect in our report. The blood sugar estimations were obtained in our study two hours after a diabetic breakfast. The potential dextrose intake of these patients, except for the thirty-five who received large amounts, were from 110 to 170 Gm. daily. With regard to the use of insulin, our patients did not all receive insulin because the diabetes of some was not sufficiently severe. We adhere to the generally accepted indications for the use of insulin in our cases. The quantity of insulin was not correlated with delayed healing of wounds or with the incidence of infection, because we did not consider that it was significant in this study. The question raised regarding the arbitrary choice of 40 years as being the age when arteriosclerosis begins is a pertinent one. We recognized this difficulty, but from our data we arbitrarily chose this age. Perhaps it should be 50 or 60; we do not know; but we do not think that selection of either of the latter ages would materially alter the data that we have presented. With regard to the number of deaths, we did not include them because we were unable to ascertain whether or not a wound healed unless the patient lived for a sufficient length of time. There was a question from the floor regarding the frequency of evisceration or separation of abdominal wounds in diabetic patients. We have not observed this to occur any more frequently in diabetic than in nondiabetic patients.

AUTOMOBILE ACCIDENTS IN A RURAL AREA TRAVERSED BY A TRANSCONTINENTAL HIGHWAY

JOHN H. POWERS, M.D.
COOPERSTOWN, N. Y.

An automobile accident in the open country is far more likely to result in serious injury and death than is a collision on the congested highways of a metropolitan district. In New York State during the past three years 8,022 persons were killed and 298,846 were injured by motor vehicles. Greater New York, with 55 per cent of the population of the state, was credited with 60 per cent of the accidents but only 30 per cent of the fatalities.[1] During these same three years rural

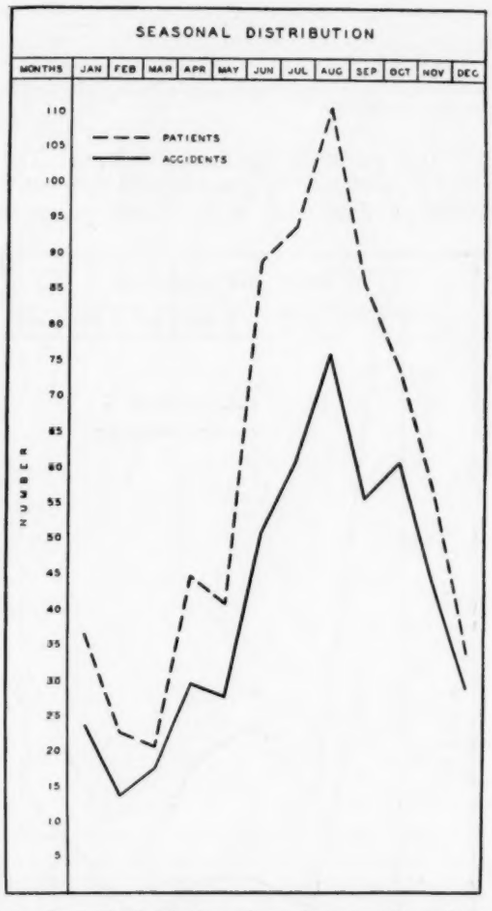

Chart 1.—Seasonal distribution of rural automobile accidents. The solid line represents the number of accidents each month, the broken line the number of patients injured. August is the most dangerous month.

New York, with 15 per cent of the population, was credited with 40 per cent of the fatal accidents.

The surgical staff of the Mary Imogene Bassett Hospital in Cooperstown, N. Y., is in a particularly favorable position for the study of automobile accidents in a rural area. The village is situated in the eastern central part of the state, 10 miles south of U. S. Route 20 a transcontinental highway from Boston and New York through Albany, Syracuse, Buffalo, Cleveland

From the Department of Surgery of the Mary Imogene Bassett Hospital.

Read before the joint meeting of the Section on Surgery, General and Abdominal, and the Section on Orthopedic Surgery at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. Monthly and Annual Reports of the Bureau of Motor Vehicles of the Department of Taxation and Finance of the State of New York, Albany, 1937, 1938 and 1939.

and Chicago to the West. The hospital serves an area 50 miles in length along this highway and most of the persons seriously injured on this section of Route 20 are referred there for treatment.

The survey embraced by this report is based on the analysis of 492 accidents from which 712 patients were received at the hospital during the years 1930-1939 inclusive. It includes all the accidents in which a motor vehicle participated in any way other than those which occurred in a public garage or on a farm. The material will be presented in graphic and tabular form in two sections: first, that which deals primarily with the accidents and the number of persons hurt and, second, that which applies particularly to the patients and their injuries.

TABLE 1.—*Type of Locality in Which 492 Rural Automobile Accidents Occurred*

Locality	Accidents		Patients	
	Number	Per Cent	Number	Per Cent
Open country	308	72.0	487	76.7
Rural village	120	28.0	148	23.3
Unknown	64		77	
Total	492		712	

The percentages have been computed only from those accidents about which the facts are known.

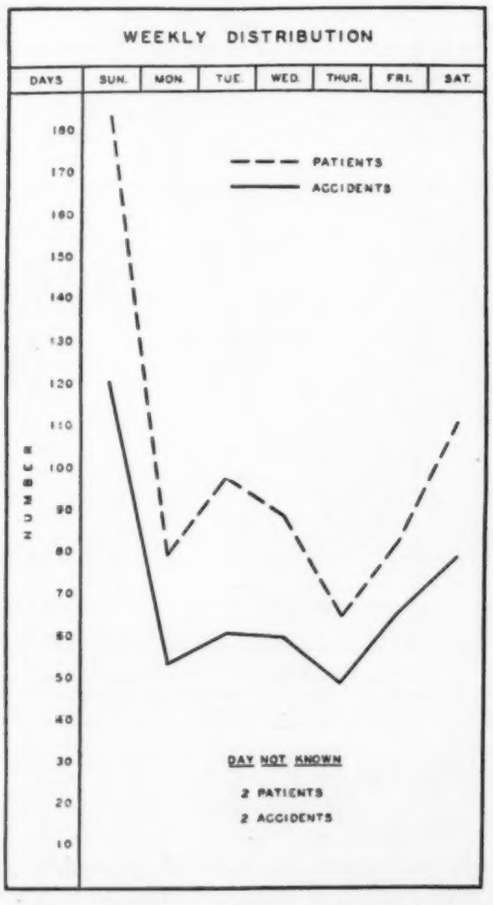

Chart 2.—Weekly distribution of rural automobile accidents and number of persons injured thereby. Both are most common on Sunday.

ANALYSIS OF ACCIDENTS

Seasonal, Weekly and Daily Distribution.—The distribution of these accidents throughout the year and the number of patients injured each month are presented in chart 1. The heavy solid line represents the number of accidents, the broken line the number of patients. The sharp increase in the number of accidents and particularly in the number of persons injured on the open road during the summer is striking. The peak occurs in August, which is without question the most dangerous month of the year in the country,[2] both on the highway and on the farm.[3] It is interesting that February and March, when the roads are in the worst possible condition, are the safest months for travel in rural areas.

In chart 2 is presented graphically the distribution of rural motor accidents by days throughout the week. The week end is extremely hazardous, particularly Sunday. Not only do most accidents occur on this day but more people are injured per accident. Monday and Thursday are comparatively safe.

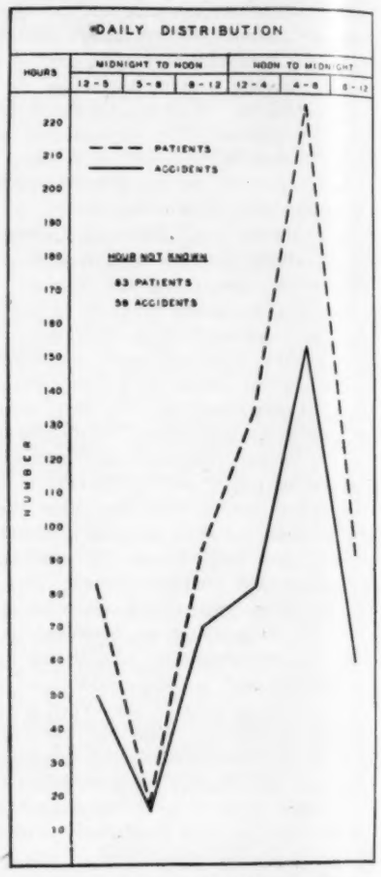

Chart 3.—Daily distribution of rural motor accidents and casualties. Both are most numerous between the hours of 4 and 8 p. m., least common between 5 and 8 o'clock in the morning.

Chart 3 represents the distribution of accidents throughout the day. It is apparent that the hours of late afternoon and early evening are the most dangerous. Traffic is heaviest during this portion of the day, drivers and pedestrians both are weary, and both are anxious to reach their destinations; excessive speed by the former and undue carelessness by the latter are common. The hours between 5 and 8 o'clock in the morning are safest for travel on the open road; drivers are rested and traffic is light.

Sixty per cent of these 492 accidents occurred during the hours of daylight, 33 per cent at night, and 7 per cent during the dusk of early morning or late afternoon.

Location of Accidents.—The location of sixty-four accidents in which seventy-seven patients were injured is unknown. Seventy-two per cent of the remaining accidents, in which 76.7 per cent of the patients were involved, occurred in the open country (table 1).[4]

Thirty-six and one-tenth per cent of the accidents took place on straight roads, 20.7 per cent on curves, 12.9 per cent at intersections and 10.1 per cent on hills. Many of the fifty-four accidents which occurred in driveways, yards, parking spaces and private garages

2. Powers, John H.: Rural Medicine: Emergency Surgery in a Rural Hospital, Springfield, Ill., Charles C. Thomas, Publisher, 1939, pp. 51-63.

3. Powers, John H.: The Hazards of Farming, J. A. M. A. 113: 1375-1378 (Oct. 7) 1939.

4. In this and all subsequent tabulations the percentages have been computed from only those accidents about which the facts are known.

were due to passengers falling while entering or leaving cars or to drivers cranking or repairing their own machines (table 2).

Classification of Accidents.—Accidents in which the car was in motion but no collision occurred were most frequent. These were usually due to failure to make a turn by an operator who was driving too fast on a road with which he was unfamiliar (table 3). Collisions between motor vehicles, with fixed objects, and with pedestrians were next in order of frequency. These four types comprised 82.6 per cent of those accidents in which the data are known.

Types and Condition of Vehicles Involved.—Of 607 vehicles involved, 84.7 per cent were passenger cars (table 4); 82.2 per cent of the vehicles were apparently in good condition, a fact which strongly suggests that most of the accidents were due to carelessness of the driver; 3.4 per cent had defective tires, 2.8 per cent defective brakes, 2.4 per cent defective headlights and 1.9 per cent a defective steering mechanism (table 5).

Types of Collisions.—Head-on collisions and sideswipes were most common and comprised 73.5 per cent of the accidents. Angle and rear end collisions were less frequent. Two hundred and thirty patients were injured in 184 accidents in which no collision occurred.

Direction of Travel.—Eighty-two per cent of the patients were injured while traveling straight ahead. Surprisingly few mishaps occurred while turning in either direction or backing. The solution of the problem of automobile accidents on rural highways appears to rest largely with the operator who is driving forward.

Condition of Drivers, Roads and Weather.—Eighty-three per cent of the accidents happened while the vehicles were being operated by drivers who were apparently normal; 9.3 per cent were obviously intoxicated and 4.1 per cent were admittedly asleep.

Nearly 70 per cent of the accidents in which likewise 70 per cent of the patients were injured occurred in clear weather. Those which took place when the sky was overcast or during rain, fog and snow are listed in order of frequency in table 6.

TABLE 2.—*Topographic Location of Accidents; Number and Percentage of Patients Injured in Each Locality*

Topography	Accidents		Patients	
	Number	Per Cent	Number	Per Cent
Straight road	143	36.1	220	36.9
Curve	82	20.7	143	23.9
Intersection	51	12.9	67	11.3
Hill	40	10.1	62	10.4
Hill and curve	14	3.5	29	4.9
Bridge or underpass	7	1.8	14	2.4
Railroad crossing	5	1.3	5	0.8
Driveway, yard, parking space or garage	54	13.6	56	9.4
Unknown	96		116	
Total	492		712	

Two thirds of the accidents in which the data are known happened on dry roads. Wet pavement was a contributory factor in 20.2 per cent; ice and snow were responsible for only a small proportion.

COMMENT

From the preceding facts it is apparent that persons who wish to comply with every precaution for safety on the rural highway should confine their driving to any Thursday in February or March between the hours of 5 and 8 o'clock in the morning. If the road is crooked with many intersections, the surface snowy or icy and the weather foggy, one may venture forth with a reasonable certainty of reaching one's destination. And, as a matter of fact, such is actually the case because under those conditions one will be forced to drive both slowly and carefully.

ANALYSIS OF INJURIES

Distribution by Age and Sex.—In the rural section of central New York embraced by this study both sexes were injured in automobile accidents very much more often between the ages of 15 and 24 inclusive than during any other decade of life. Throughout all ages males were involved with twice the frequency of females (chart 4).

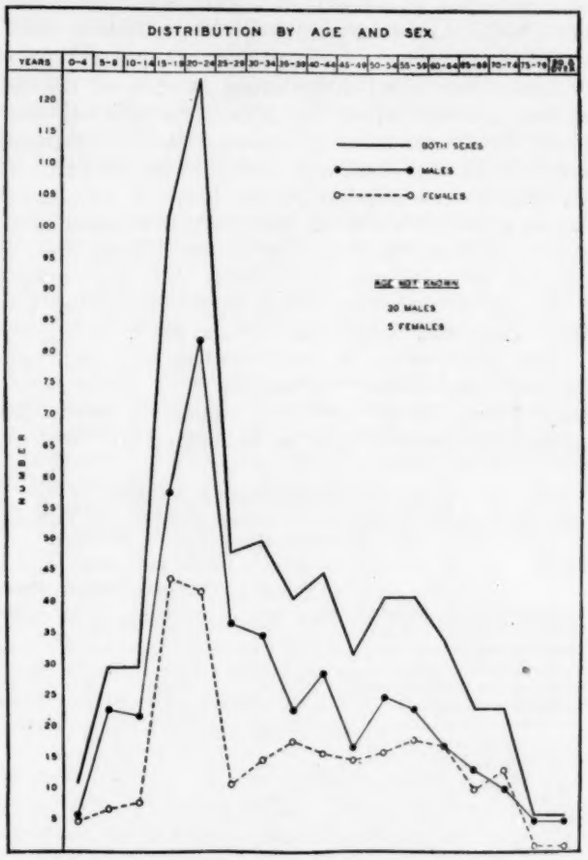

Chart 4.—Graphic analysis by age and sex of persons injured in 492 automobile accidents.

Position of Patients When Injured.—Drivers and passengers in the front seat were injured with equal frequency, passengers in the rear seat less than half as often. Pedestrians and cyclists comprised only a small proportion of the patients (table 3).

Classification of Injuries.—The 712 patients injured in these 492 accidents received 2,891 recorded injuries, classified according to the second edition of the Standard Classified Nomenclature of Disease. Fractures comprised the most common group; there were 655, of which seventy-four were compound. Lacerations, contusions and abrasions were next in the order of frequency. One hundred and eighty-four of the patients sustained concussion of the brain and 104 patients were in shock when they arrived at the hospital, an incidence of 26 per cent for the former and 15 per cent for the latter.

Topographic Location of Injuries.—Actually of more interest in a study of the injuries received in automobile accidents is their topographic distribution. The head and neck appear to be most susceptible and in this series were injured twice as frequently as any other portion of the body. Traumatic lesions of the shoulder and upper extremity, the trunk, and the hip and lower extremity were comparable to one another in numbers but less than half as common as injuries of the head and neck.

Period of Hospitalization.—As a result of these automobile accidents, 473 patients spent 9,580 days in the hospital, or a total period of 26.3 years. Eighty-nine patients were admitted for one day or less, and thirty-eight patients spent only two days. The average period of hospitalization was 20.3 days. Eighty patients made only one visit to the accident ward and then went on their way. The average number of visits was four.

Fatalities.—Thirty-five accidents were fatal. Twelve persons were killed immediately or died at the scene of the accident before the ambulance arrived; two of these are known to have sustained multiple compound fractures of the skull and face. Seven patients were moribund on admission to the hospital and survived for an average period of only thirty-five minutes after arrival. With the exception of one patient who succumbed to a pulmonary embolus 237 days after his accident, the duration of life in the remaining fifteen fatal cases was approximately six days.

The chief causes of death among the twenty-three patients who reached the hospital were fractures of the skull (seven simple and five compound) twelve cases, intracranial hemorrhage without fracture two cases, fracture-dislocation of the spine (one cervical and one dorsal) two cases, crushing injury of chest with ruptures of multiple intrathoracic and intra-abdominal viscera one case, pulmonary embolism three cases and bronchopneumonia two cases.

The mortality rate for accidents on the open road was 8.5 per cent; in other words, one accident out of every twelve was fatal.

TABLE 3.—*Classification of Accidents*

Type	Accidents		Patients	
	Number	Per Cent	Number	Per Cent
Collision between motor vehicles	104	22.2	206	30.0
Collision with fixed object	89	19.0	152	22.2
Collision with pedestrian	76	16.2	81	11.8
Collision with bicycle	8	1.8	9	1.3
Collision with railroad train	4	0.9	4	0.6
Collision with animal	3	0.6	4	0.6
No collision—car in motion	118	25.2	162	23.6
No collision—car stationary	66	14.1	68	9.9
Unknown	24		26	
Total	492		712	

TABLE 4.—*Types of Vehicles Involved in 492 Accidents in Which 712 Patients Were Injured*

Type	Accidents		Patients	
	Number	Per Cent	Number	Per Cent
Passenger cars	514	84.7	636	89.4
Trucks	68	11.2	48	6.7
Motorcycles	16	2.6	18	2.5
Bicycles	8	1.3	9	1.3
Bus	1	0.2	1	0.1
Total	607		712	

SUMMARY

During the years 1930-1939 inclusive 712 patients were treated for 2,891 injuries sustained in 492 automobile accidents in a rural area traversed by a transcontinental highway.

Such accidents occurred most frequently on week ends during the summer while driving straight ahead in open country on dry roads in clear weather during the hours of daylight. Accidents in which no collision occurred were most frequent; head on collisions with other cars, with fixed objects and with pedestrians were common. Eighty-two per cent of the vehicles were apparently in good condition and 83 per cent of the drivers were apparently normal.

Males were involved twice as frequently as females. Serious injuries were common. Fractures comprised 22 per cent of the traumatic lesions; 26 per cent of the patients sustained concussion of the brain and 15 per cent were in shock. The head and neck were injured with twice the frequency of the trunk or either of the extremities.

The average period of hospitalization was 20.3 days and the average number of outpatient visits was four.

The mortality for accidents on the open road was 8.5 per cent.

TABLE 5.—*Condition of Vehicles Involved*

Condition	Accidents	
	Number	Per Cent
Apparent good condition	438	82.2
Defective tires	18	3.4
Defective brakes	15	2.8
Defective headlights	13	2.4
Defective steering mechanism	10	1.9
Defective tail lights	5	0.9
Other mechanical defects	34	6.4
Unknown	74	
Total	607	

TABLE 6.—*Condition of the Weather*

Weather	Accidents		Patients	
	Number	Per Cent	Number	Per Cent
Clear	230	69.3	360	69.2
Rainy	37	11.2	56	10.8
Cloudy	23	6.9	37	7.1
Foggy	23	6.9	34	6.5
Snowy	19	5.7	33	6.4
Unknown or irrelevant	160		192	
Total	492		712	

CONCLUSION

Excessive speed and lack of acquaintance with the hazards of the open road are responsible for most automobile accidents on rural highways.

ABSTRACT OF DISCUSSION

DR. ALAN DEFOREST SMITH, New York: Within recent years the surgeon in rural communities has been confronted with a type of serious accident which is entirely new, and on the whole he has acquitted himself very creditably. This applies not only to hospitals and surgeons of the type of the staff at Mary Imogene Bassett Hospital, where, of course, one would expect these conditions to be well treated, but to the surgeons throughout the country. Partly responsible for this are the activities of the Committee on Fractures of the American Medical Association and of the American College of Surgeons, who have done so much work in raising the standard of the treatment of fractures throughout the country. This is

going to have an important bearing on our participation in the activities which are now going on abroad. When we get into the show this time we shall find that we have many more surgeons who are well trained in treating fractures and serious injuries than we had last time. Indifference of the country as a whole to a situation which results in as many casualties yearly as we suffered from our participation in the World War is something that is hard to comprehend. Publication of statistics of this kind will help very much to bring about some reaction that will result in lessening these accidents. I hope that the statistics which Dr. Powers has will be made available to the public, because I think that there they will do the most good. One of his outstanding conclusions is that the reckless driver is chiefly responsible for the large number of accidents, but nevertheless the careful driver, the innocent man, is just as likely to suffer as a result of the reckless driving as the man who is himself responsible. One way we could diminish these accidents is to be more strict about revoking licenses of habitually careless and reckless drivers. The wisdom of issuing automobile licenses to minors is questionable, and that is borne out by the very large number of minors and young people who are involved in accidents. Any one who operates or owns an automobile should be compelled to insure himself against the economic consequences of the accidents that may occur. That applies not only to the people who are injured in the accident but also to the hospital and the doctor. The dictates of ordinary humanity demand that any doctor or any hospital shall take care of the patient who is injured in this way out in the country, and yet very often they are not recompensed in any way and they certainly should be. These people should be compelled to insure themselves against the consequences of these accidents.

DR. JOHN H. POWERS, Cooperstown, N. Y.: I have some statistics on one point which Dr. Smith brought out, namely the financial aspect of these accidents. At the Mary Imogene Bassett Hospital the staff is on a full time basis and all the bills are rendered and collected by the hospital. I was interested in discovering that 73 per cent of these 712 bills were paid in full, 12 per cent were paid in part and 15 per cent had to be written off completely. This 15 per cent represented a loss during the past ten years of approximately $20,000. The other point I wish to emphasize is this: That by the most conservative estimate at least 95 per cent of all automobile accidents are due to recklessness and carelessness and are therefore preventable. The reduction of such accidents is a problem of national importance and is worthy of consideration by every surgeon who is fundamentally interested in the preventive aspect of his profession.

The Fluoroscope Replaces Mantoux Test.—In Puerto Rico the fluoroscope is our chief instrument for the early diagnosis of tuberculosis, while the pneumothorax apparatus constitutes our great recourse for controlling the spread of tubercle bacilli. We are using the fluoroscope as a substitute for the tuberculin test in the screening of suspicious cases of tuberculosis in adults and in children above the age of 12. We feel justified in this substitution because of the high proportion of tuberculin reactors above the age of 12. Over 80 per cent of children in the teens give positive reactions to the Mantoux test and we have concluded that it saves time, effort and money to fluoroscope every suspicious adolescent and adult on his first visit to the clinic rather than wait for the result of a tuberculin test which in over 80 per cent of the cases will be positive. . . . We take x-ray pictures with our fluoroscopes. They are 30 milliampere machines, and, where a radiographic equipment is not available, they are equipped with a timer and a casette-stand which make possible the taking of x-ray plates with very simple adjustments. . . . The fluoroscopic work is done by specialists, but the medical officers of the public health units are being trained in its use. The number of fluoroscopic examinations made in the tuberculosis clinics of the Health Department during the fiscal year 1938-1939 was 71,220.—Pastor, J. Rodriguez: The Fluoroscope and the Pneumothorax Apparatus as Tools for the Protection of the Public Health, *Puerto Rico Health Bulletin,* September 1940.

THE EFFECT OF ALCOHOL ON VISION

AN EXPERIMENTAL INVESTIGATION

Z. WILLIAM COLSON, M.D.
BOSTON

These experiments were suggested by two personal subjective observations. The first was made rather startlingly in France over twenty years ago, following a champagne binge with a group of fellow aviators. When we left the café and started back to our billets my peripheral fields seemed to be markedly contracted, although central visual acuity appeared to be unaffected. I felt that I was looking through a pair of nonmagnifying binoculars. The second observation was made more recently. On leaving a brightly lighted cocktail party and stepping immediately into the dark, there seemed to be a definitely prolonged interval of my dark adaptation.

The first of these experiments were conducted in my office, but concern as to my local reputation necessitated transfer of the work to a research laboratory. I was particularly fortunate in my choice of "guinea pigs." Most of them were young professional men of higher than average intelligence and cooperation. Some were able to persuade their wives to be subjects for testing.

There were twenty-one subjects in all, and their ages ranged from 27 to 44. The average age was under 30.

A preliminary test was made of visual acuity, near vision, visual fields, color vision, muscle balance and dark adaptation. Each subject was then given a carefully measured 2 ounces of good quality rye or scotch with ginger ale or soda as he chose. Some preferred their drinks straight. The 2 ounce drinks and tests were repeated at half hour intervals until the subjects reached their gastric tolerance or in some other manner became incapacitated for further tests.

Since the intake was rapid enough to constitute fairly serious drinking, most of the tests were discontinued after 8 or 10 ounces, although one subject succeeded in consuming 20 ounces and was fully cooperative throughout the entire experiment.

The purpose of the tests was to determine the immediate visual effects of a few drinks as ordinarily consumed by the drinking public. There was no attempt to appraise the effects of chronic alcohol intoxication.

RESULTS OF TESTS

Visual Acuity.—Vision was taken by artificial illumination so that the light would remain the same throughout the experiments. In each case visual acuity in the preliminary test was 20/20—1 or 2, or better, with correction. Only three subjects showed any demonstrable reduction in visual acuity, and this reduction can be explained by the fact that in these cases the test was immediately followed by violent emesis.

Near Vision.—A Lebensohn near vision test chart was used at a distance of 14 inches. Most of the subjects at the outset had better than normal near vision, rating 1.2. There was no appreciable change after the alcohol intake.

Visual Fields.—A complete peripheral field was not done in these cases, because it was thought that the element of fatigue might enter as a definite factor. To simplify the procedure, in each case the fields were

From the Howe Laboratory of Ophthalmology, Harvard University, and the Massachusetts Eye and Ear Infirmary.

taken on a standard perimeter, for one eye only, in the four cardinal directions. There was not the slightest variation in fields following alcohol intake.

Color Vision.—Color vision was tested by use of Ishihara charts under uniform artificial illumination. There was only one color blind individual found on the preliminary test, and his subsequent reading of the figures did not indicate any change in color vision. All others showed no change in color vision.

Dark Adaptation.—This was determined with an apparatus incorporating a graded wedge as the filter. The subject was preexposed to a bright light for three minutes before measurements were begun. Since I had no experience with this apparatus, Dr. David Cogan was kind enough to supervise the dark adaptation tests. From the standpoint of directness and simplicity, this test was the most difficult. It is a procedure which requires close attention and cooperation and, frequently repeated, may cause fatigue. If the tests had shown a slowing of dark adaptation, this could have been ascribed to lack of attention or delayed verbal response to light stimuli. In spite of these difficulties the curves, with one exception, came well within normal limits. The only subject who showed a prolongation of adaptation time was also the one who showed low dark adaptation in the preliminary test. Alcohol appeared further to increase slightly the time interval of adaptation in his case.

Lateral Duction Tests Before and After Drinking

	Phoria	Conventional Abduction	Real Abduction	Conventional Adduction	Real Adduction
A. Preliminary.....	2 △ exophoria	8 △	6 △	28 △	30 △
After 20 ounces..	9 △ esophoria	0 △	9 △	32 △	23 △
B. Preliminary.....	2 △ esophoria	2.5 △	4.5 △	40 △	38 △
After 8 ounces...	4 △ esophoria	0 △	4 △	40 △	36 △
C. Preliminary.....	0 △	8 △	8 △	30 △	30 △
After 10 ounces..	5.5 △ esophoria	0.5 △	6 △	18 △	12.5 △

These tests suggest that alcohol has no effect on dark adaptation when one's margin of safety is high, but it may have a definite effect when through vitamin A deficiency or severe fatigue the reserve is low. Conceivably, alcohol could lower dark adaptation either by hastening the combustion of visual purple or by retarding its formation.

In spite of the fact that the dark adaptation tests employed did not show anything conclusive, I believe that further tests in which the visual purple is more completely broken down and in which a shorter interval is allowed for a first reading should be done. They may show whether a persistence of light scotoma or retardation of perception in the dark may occur—as in seeing objects on the road after being subjected to the glare of oncoming headlights. Until such tests are devised and are sufficiently conclusive, one should not assume that there is no momentary involvement of dark adaptation after the consumption of alcohol. While the tests done in this series show no appreciable change in shape of the recovery curve, there may have been changes in the first portion of the curve which the technic employed was not quick enough to catch. Such retardation, if present, would be extremely hazardous in night driving.

Muscle Balance.—This was determined by the use of a Maddox rod and variable prism. The results of all preliminary tests were well within normal limits—in sixteen subjects there was esophoria of less than 1 prism diopter, in one 1, in two 2 and in one 3. One subject had exophoria of 2 prism diopters. Hyperphoria in no case exceeded ½ prism diopter. The tests were repeated during the experiment every half hour. There was practically no effect on the vertical muscle balance—only in two cases was it increased 1 prism diopter—but there was a gradually increasing esophoria in each case, which in two cases reached the stage of actual strabismus with diplopia. In one of the latter cases the esophoria increased from 3 to 8 prism diopters, in the other case from 0 to 3.5. The minimum change in muscle balance was 2 prism diopters (two cases), the maximum was 11 (one case). In the latter the change was from 2 prism diopters exophoria to 9 prism diopters of esophoria, and it is interesting to note that there was no diplopia in this case, and that the patient passed through a stage of orthophoria.

Duction tests were made on three subjects. These were made in the usual manner, a variable prism and a distant fixation light being employed. The results obtained are shown in the accompanying table.

According to the conventional notation, the abduction in all cases was reduced. But duction power can be determined only by allowing for the muscle balance at the time of the test. Making this allowance, the real abduction was very little affected—in A it was actually increased. The real adduction was decreased in each case, in C markedly.

As pointed out by Verhoeff,[1] it is probable that the conventional tests for adduction do not reveal the involuntary adduction (analogous to sursumduction) but chiefly the voluntary convergence power.

In view of the fact that alcohol has little effect on real abduction, it is probable that it depresses the convergence center and has little effect on the involuntary adduction.

It is evident that the diplopia which alcohol produces in normal subjects is due to an increasing esophoria which finally cannot be overcome by the abduction, although this remains almost unchanged. Since alcohol is known to be a depressant, it is not surprising that the real adduction should be reduced, but in view of the latter fact it is indeed surprising that esophoria rather than exophoria should develop.

While no depth perception tests as such were done, it seems probable that the esophoria noted would have a definite effect on depth perception. It would seem that one who drinks frequently would be more likely to educate oneself to allow for changes in distance values under these varying conditions of muscle balance than would the very occasional drinker. It was suggested to me by Dr. Verhoeff that the esophoria would affect chiefly the judgment of absolute distance and have no important effect on that of relative depth.

CONCLUSIONS

Visual tests following the consumption of alcohol by twenty-one normal individuals showed no diminution of visual acuity, visual fields or color vision.

Except in one case, in which the dark adaptation was already abnormally low, conventional tests for dark adaptation showed that alcohol had no appreciable effect on the shape of the recovery curve.

Tests of muscle balance showed no tendency to hyperphoria, but all subjects showed a gradually increasing esophoria. Two subjects progressed to actual convergent strabismus with diplopia in the latter part

1. Verhoeff, F. H.: Hyperphoria Tests Based on a New Principle, Arch. Ophth. **22**: 743-759 (Nov.) 1939.

of the tests. One subject had definite exophoria at the outset and therefore passed through a stage of orthophoria before becoming esophoric.

The diplopia that results from alcohol is asssociated with a reduction, not with an increase, in convergence power and is dependent on the development of esophoria too great to be overcome by the abduction power, although this remains unchanged.

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CHRONIC FRIEDLÄNDER INFECTIONS OF THE LUNGS

REPORT OF SEVENTEEN CASES AND OBSERVATIONS ON THERAPY WITH SULFAPYRIDINE AND SULFANILAMIDE

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In a recent communication I reported a series of cases of acute Friedländer pneumonia, giving reasons for considering this disease as a distinct and primary form of pneumonia.[1] Before proceeding to a description of chronic lung infections caused by the Freidländer bacillus (Bacillus mucosus capsulatus), the essential features of the acute disease will be reviewed briefly.

In common with other pneumonias, the onset is usually sudden, with chills, fever, cough and pain. The clinical course, however, is fulminating and the mortality extremely high. Certain other features serve further to distinguish Friedländer pneumonia from other forms:

1. Pneumonia due to the Friedländer bacillus comprises from 1 to 3 per cent of all pneumonias and occurs almost exclusively in the later decades of life with a considerable preponderance of males over females. It almost never occurs in children.

2. Hemoptysis is a frequent initial symptom in this disease. Herpes is uncommon, but jaundice is a rather frequent accompaniment.

3. Though the lesion is lobar in distribution, the classic signs of consolidation such as bronchial breathing and pectoriloquy are absent in about half the cases. When one observes the heavy, soggy lung at necropsy, the dulness and suppressed breath sounds are readily explained. Involvement of the upper lobe and involvement of more than one lobe are frequent.

4. The temperature is less regular, and low grade fever is more common than in pneumococcic pneumonia.

5. The gross appearance of the sputum generally is characteristic. It is that of a brick-red homogeneous emulsion of blood and mucus, in contrast to the rusty taffy-like sputum of pneumococcic pneumonia. A direct smear of the sputum stained by Gram's method will usually show a predominance of the typical gram-negative bacilli surrounded by a clearer zone representing the capsule. Inoculation of the sputum into the mouse, an animal extremely susceptible to this organism, will invariably confirm the diagnosis.

6. Pure cultures of the Friedländer bacillus are obtained from the sputum, from the lung juice and frequently from the blood cultures.

7. Leukopenia and monocytosis with a shift to the left in the Schilling index are frequent, leukocytosis appearing in the complicated cases.

8. Bacteremia is more frequent but is quantitatively less intense than in pneumococcic pneumonia. The mortality rate is apparently little affected by the absence of bacteremia.

9. Abscess formation is the most frequent complication, empyema and meningitis are less common. The Friedländer bacillus may readily be cultivated from the pus and spinal fluid in such cases.

10. At necropsy the involved lobes are marked chiefly by some degree of softening and necrosis of the lung with the presence of a characteristic dirty, slimy exudate on the cut surface. Culture of the lung, if necropsy is performed soon after death, yields the Friedländer bacillus, and on microscopic section the organisms may be seen as gram-negative encapsulated rods lying free in the alveoli and within the cells.

From the foregoing considerations it will be seen that usually acute Friedländer pneumonia terminates fatally within a relatively short time. With the exception of the very few who recover completely, the surviving patients pass into the chronic stage. Observations on this latter group of lung infections known as chronic Friedländer pneumonia will now be presented.

In contrast to the fulminating and highly fatal character of the acute disease, the chronic Friedländer lung infections run a protracted and relatively benign course, months or years in duration. The Friedländer bacillus shows a marked tendency to cause nonputrid pulmonary necrosis, though it never leads to caseation. Hence, because of the presence of cavities in the lung and because of the frequent upper lobe involvement, the chronic form of the disease is very commonly mistaken for pulmonary tuberculosis.

Although the time element is important in separating the cases into acute and chronic groups, nevertheless, it is difficult to draw a distinct dividing line. Bullowa, Chess and Friedman[2] report that 75 per cent of their patients with acute Friedländer pneumonia died within eight days and that the average clinical course was less than two weeks. The experience of other authors is similar. My own acute cases followed a course lasting from two to sixteen days. Arbitrarily, therefore, a time limit of four weeks may be allowed beyond which a case should be considered as falling into the chronic group.

For the sake of completeness, it should be mentioned that the Friedländer bacillus not uncommonly is encountered as a secondary invader in the course of other pulmonary infections.[3] However, because of limitations of space, such cases are purposely omitted from this presentation. For the same reason, there will be no discussion here of the important and interesting extrapulmonary infections caused by the Friedländer bacillus.

LITERATURE

The importance of the Friedländer bacillus as a cause of chronic lung infections is beginning to receive greater recognition. Recently, Amberson has emphasized that in suspected cases of chronic pulmonary tuberculosis when repeated examinations of sputum reveal no tubercle bacilli, it is important to search for the Friedländer bacillus as a possible causal agent.[4] Nevertheless, the number of chronic Friedländer lung infections reported in the literature is small.

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Owing to lack of space, figures 8, 9, 10, 15, 16 and 17 have been omitted; they are included in the reprints.

From the Fourth Medical Division of Bellevue Hospital, Dr. Charles H. Nammack, director, and the Dr. Simon Baruch Foundation for Research.

Four of the cases presented here were observed in the wards of the Tuberculosis Service, Dr. J. Burns Amberson, director. Certain of the laboratory studies in these four cases and one other were done as part of a study of sulfapyridine therapy conducted by the Bellevue Hospital Pneumonia Investigation.

1. Solomon, Saul: Primary Friedländer Pneumonia, J. A. M. A. **108**: 937 (March 20) 1937.

2. Bullowa, J. G. M.; Chess, Joseph, and Friedman, N. B.: Pneumonia Due to Bacillus Friedländeri, Arch. Int. Med. **60**: 735 (Nov.) 1937.

3. Belk, W. P.: Pulmonary Infections by Friedländer's Bacillus, J. Infect. Dis. **38**: 115 (Feb.) 1926.

4. Amberson, J. Burns: Personal communication to the author.

One of the earliest cases was reported by Sisson and Thompson.[5] This concerned a 31 year old man who developed a bronchopleural fistula and a Friedländer bacillus empyema, making an apparently complete recovery in three months. Belk [3] in 1926 reported three cases of chronic pulmonary suppuration due to the Friedländer bacillus and pointed out the possibility of confusion with pulmonary tuberculosis. Stoichitza and Jonnesco [6] in 1933 observed a patient with lung abscess following tonsillectomy who died after thirty-six days, the blood culture showing Friedländer's bacillus. In 1930 Crohn [7] reported the case of a man with Friedländer pneumonia and bacteremia who died after an illness of two months, showing at autopsy an ulcerative polypoid endocarditis of the mitral valve with septic infarcts in the spleen, kidneys and intestine.

Sweany, Stadnichenko and Henrichsen [8] had the opportunity to study one case for twenty-eight months. The patient was a 45 year old man whose illness began suddenly with pneumonia of the right upper lobe. The lesion subsequently spread to the left upper lobe and resulted in bilateral upper lobe cavities closely simulating tuberculosis. The case closely parallels that described by Westermark [9] which began as an acute pneumonia but resulted in thin-walled abscesses in both upper lobes, death occurring after seven months of illness. Schapper [10] in 1931 described a similar case in which death followed operation for lung abscess after an illness of three months. Stengel and his associates [11] have reported the largest series to date (four cases) and in several publications have outlined the characteristic roentgenologic picture.

INCIDENCE

It is difficult to estimate the incidence of chronic Friedländer pneumonia. For comparative purposes, it may be noted that it is less common than acute Friedländer pneumonia, which in turn comprises approximately from 1 to 3 per cent of all adult cases of pneumonia. It is probable, however, that the disease is more common than is generally supposed since, as stated, this condition is frequently mistaken for other chronic lung diseases.[12]

Chronic Friedländer pneumonia occurs chiefly in the later decades of life. The patients in this series ranged in age from 34 to 69 years, the average age being 49 years. No case has yet been observed in childhood. The disease is more frequent in males, twelve of the patients in this series being males and five females. All the patients were white. The seasonal incidence is not striking. Ten cases occurred in the six inclement months from November to April inclusive and only seven in the remaining six months.

Alcoholism as a predisposing factor was recorded in nine cases. The association between cirrhosis of the liver and Friedländer infection is not uncommon. Occupation apparently plays no role. In two of the cases the pneumonia followed submersion (drowning) and parturition respectively.

CLINICAL COURSE

With only three exceptions all the cases began acutely with a combination of the following symptoms: general malaise, chills, fever, pleuritic pain and cough. Gastrointestinal symptoms occurred in only three cases and in one of them was due to an associated hepatic condition.

The temperature was quite irregular, ranging from normal to 105 F. In several cases in which suppuration was severe, there were marked diurnal variations in the fever. In some instances, varying periods of normal temperature alternated with febrile episodes. The temperature came down by lysis in seven of the nonfatal cases, on the average about the forty-fifth day of illness, though low grade pyrexia frequently persisted afterward for weeks or months. In three of the four cases treated with sulfapyridine, the fever dropped sharply within twenty-four to seventy-two hours and in one instance the fever came down slowly in ten days. The only patient who received sulfanilamide had a lysis after seven days of treatment. In the four fatal cases, death occurred after thirty-six days, forty-three days, thirty days and fourteen months respectively.

For the purpose of convenience the entire illness may be divided into two phases: first the acute stage, where there ensues in the majority of cases an aputrid necrosis of the lung and quite frequently pleural effusion, whether purulent or serous. Second, if the patient survives, there occurs the stage of chronic pulmonary suppuration with one or more thin-walled abscesses, bronchiectasis or fibrosis or a combination of these processes, which so far as I know may persist indefinitely with exacerbations and remissions. Death may occur at any point in the clinical course but occasionally, if the lesion is not too extensive, there may be apparently complete resolution.

During the early stages, most of the patients were severely ill and prostrated and were in effect suffering from acute Friedländer pneumonia. After a varying period, the illness assumed the features of chronicity, lasting anywhere from one month to more than three years as far as could be determined. Moreover, there were individuals who recovered and were discharged with incomplete clearing of the lungs only to be readmitted after a lapse of months with a recurrence or an exacerbation of the disease. It should be emphasized, therefore, since most of the illnesses began as pneumonia, that patients who have recovered from acute Friedländer pneumonia should not be dismissed from observation too soon because of the strong possibility of the development of chronic lung changes.

Herpes was noted in only one case. No petechiae or other cutaneous lesions were seen. Jaundice was noted in only two cases. In one it was associated with a subdiaphragmatic abscess, in the other with cirrhosis of the liver. None of the patients showed clubbing of the digits.

While no extensive immunity studies were carried out, an attempt was made in six nonfatal cases to determine at different intervals in the course of the disease the presence of immune bodies as exemplified by agglu-

5. Sisson, W. B., and Thompson, C. B.: Friedländer Bacillus Pneumonia with Report of Cases, Am. J. M. Sc. **150**: 713 (Nov.) 1915.
6. Stoichitza, N. N., and Jonnesco, D.: Abscès du poumon et septicémie à pneumobacilles de Friedländer, Arch. méd.-chir. de l'app. respir. **8**: 534, 1933.
7. Crohn, W. H.: Septische Endocarditis durch Bacillus Friedländer, Med. Klin. **26**: 552 (April 11) 1930.
8. Sweany, H. C.; Stadnichenko, Asya, and Henrichsen, K. J.: Multiple Pulmonary Abscesses Simulating Tuberculosis, Arch. Int. Med. **47**: 565 (April) 1931.
9. Westermark, N.: Pneumonia with Friedländer's Bacillus Simulating Tuberculosis, Acta radiol. **7**: 626, 1926.
10. Schapper, Kurt: Ueber Friedländer-Pneumonien, Beitr. z. Klin. d. Tuberk. **78**: 741, 1931.
11. Stengel, A.; Kornblum, Karl, and Collins, L. H., Jr.: Friedländer's Pneumonia, Tr. A. Am. Physicians **43**: 326, 1928. Kornblum, Karl: Roentgen Ray Diagnosis of Pulmonary Infections with the Friedländer Bacillus, Am. J. Roentgenol. **19**: 513 (June) 1928. Collins, L. H., and Kornblum, Karl: Chronic Pulmonary Infections Due to the Friedländer Bacillus, Arch. Int. Med. **43**: 352 (March) 1929. Collins, L. H.: Chronic Pulmonary Infections Due to the Friedländer Bacillus, Arch. Int. Med. **58**: 235 (Aug.) 1936.
12. Since this article was completed, I have seen six additional cases which are not included in this report but which are similar in all important respects to the cases in this series.

tinins and capsule-swelling substances.[13] In general they were found to appear in the blood in the recovery phase during the first weeks of illness and to persist for from one to three weeks or longer.

Only four of the seventeen patients in this series died, a mortality of 23.5 per cent as compared with 97 per cent in the acute group. However, these statistics are not final since several patients have not returned for observation after leaving the hospital. Four of the patients have not yet been discharged, though it appears likely that they will recover. Five others have returned to their usual mode of life and are followed at intervals in the clinic.

TABLE 1.—*Clinical Course, Treatment and Results in Seventeen Cases of Chronic Friedländer Pneumonia*

Case	Age	Sex	Onset	Lobes Involved	Course	Organism	Where Found	Complications	Treatment	Outcome	Comment
1. G.A.	48	M	Sudden; chills, pleurisy, bloody sputum	LUL RUL	Virulent and fatal	F.B.A.	Sputum	Lung abscess	Brscpy., guaiacol	Death on 36th day, autopsy	Moderate alcoholism
2. A. H.	45	F	Sudden; chills, pleurisy, bloody sputum	LUL	Recurring attacks of pneumonia	F.B.	Sputum, b.c.	Abscesses LUL, hemoptyses	Symptomatic	Complete cure after 3 yrs.	Alcoholism, early cirrhosis
3. D. U.	55	M	Insidious onset, fever, pleurisy	RLL	Severe with foci of suppuration	F.B.	Empyema	Empyema (F.B.), subd. abscess (B. coli)	Thoracotomy, drainage of subd. abscess	Death on 43d day	History of chronic biliary infection
4. N. K.	34	F	Sudden; chills, pleurisy, bloody sputum	Entire R. lung, LLL	Rapid downhill course	F.B.	Sputum	Spread from RUL to both lower lobes	Symptomatic	Death on 30th day	
5. M. B.	62	F	Sick 1 year; fever, cough, pleurisy	RUL	Gradual wasting; prolonged suppuration	F.B.	Sputum, empyema	Abscess, loculated empyema	Brscpy., thoracotomy	Death after 14 months	Moderate alcoholism
6. A. W.	39	M	Fever, pleurisy, mucopurulent sputum	LLL	Mild course	F.B.	Sputum, effusion	Serous effusion, incomplete resolution	Thoracentesis	Left hospital against advice	Alcoholism, monocytes 8%
7. T. M.	69	M	Acute; pleurisy and thick red sputum	Entire L. lung	Moderately severe course	F.B.	Sputum	Abscess	Symptomatic	Same	
8. G. P.	36	F	Onset postpartum with pleurisy, chills	Entire R. lung	Severe course, subsided spontaneously	F.B.	Sputum, effusion	Pleural effusion (serous)	Thoracentesis	Lysis 48th day, discharged 64th day	Monocytes 15%
9. J. B.	50	M	Chills, pleurisy, epigastric pain, red sputum	LLL	Same	F.B.	Sputum	Incomplete resolution	Symptomatic	Lysis 40th day, discharged 50th day	Alcoholism
10. J. M.	42	M	Following submersion; pleurisy, characteristic sputum	RUL, LLL	Same	F.B.C.	Sputum, b.c. (25 colonies)	Serous effusion	Symptomatic	Recovered	Alcoholism, monocytes 6%
11. J. S.	60	M	Acute; chills, pleurisy, bloody sputum	RUL	Recurring attacks of pneumonia	F.B.A.	Sputum, lung fluid	Suppuration and bronchiectasis	Symptomatic	Recovery, residual bronchiectasis	
12. M. C.	50	M	Acute; chills, pleurisy, bloody sputum	RUL	Severe; abscess and copious sputum	F.B.A.	Sputum, pus obtained by brscpy.	Abscess	Sfp., brscpy.	Recovery with cavity	Alcoholism, fatty liver
13. J. M.	41	M	Acute; chills, pleurisy; bloody sputum	RUL	Severe	F.B.B.	Sputum, b.c.	Abscess	Sfp.	.....	Alcoholism, cirrhosis, ascites
14. E. M.	46	F	Sudden; chills, pleurisy, thick yellow sputum	LUL	Severe at first, crisis in 24 hrs.	F.B.A.	Sputum, empyema	Abscess, empyema necessitatis	Sfp., brscpy., thoracotomy	Recovery with cavity and fistula	Past history of pneumonia and empyema
15. J. A.	63	..	Pleurisy, fever, characteristic sputum	LUL	Severe; crisis 3 days after admission	F.B.A.	Sputum, empyema	Abscess, empyema	Same	.....	Alcoholism
16. A. G.	50	M	Acute; chills, pleurisy, scanty pink sputum	RUL	Severe with suppuration, purulent sputum	F.B.A.	Sputum, b.c.	Abscess	Sulfanilamide	Recovery with residual abscess	Alcoholism
17. A. F.	65	M	Griplike onset; fever, brown sputum	LUL	Lung abscess, prolonged pyrexia	F.B.A.	Sputum, lung abscess	Abscess	Thoracotomy, brscpy.	Abscess and fistula	

Abbreviations: M = male; F = female; LUL = left upper lobe; LLL = left lower lobe, etc.; F.B. = Friedländer bacillus; A, B and C refer to types; subd. = subdiaphragmatic; b. c. = blood culture; brscpy. = bronchoscopy; sfp. = sulfapyridine; pnc. = pneumococci; staph. = staphylococci; strep. = streptococci; spir., fus. b. = spirochetes and fusiform bacilli.

DISTRIBUTION OF THE PULMONARY LESION

In only one case was the lesion bronchopneumonic while in sixteen it was predominantly lobar or confluent lobular in distribution. In several of these latter cases, however, in addition to the lobar lesion there was either simultaneous or subsequent patchy infection of other areas.

As shown in table 1, upper lobe lesions occurred in ten cases. In four other cases, the upper lobes were involved in conjunction with other lobes. Thus in fourteen cases (82 per cent) there was upper lobe involvement. Multiple lobe involvement occurred in five cases (30 per cent), although in only two cases of this series was there infection of both lungs.

SPUTUM

As seen from table 2, bloody sputum or gross hemoptysis was noted in five cases. In six others the sputum was at the onset the characteristic homogeneous, brick-red mixture of blood and mucus which has been described in the introductory paragraphs. It is important to note that the character of the sputum is not constant but will change during the course of the disease. It is generally bloody and mucoid during the early stages; later it becomes mucopurulent and turns either green or yellow. Hemoptysis may occur at any stage of the illness, that during the early phases being due to pulmonary congestion and necrosis and later in the disease to lung abscess or bronchiectasis. It is not usual for the sputum to become foul,

13. These tests were carried out with the technical assistance of Miss Ruth Egan.

and such an occurrence is indicative of secondary invasion by anaerobes.

If a direct smear of the sputum is stained by Gram's method, it is frequently possible to recognize the predominant organism as large gram-negative rods sur-

TABLE 2.—*Gross Appearance and Cultural Characteristics of the Sputum*

	Gross Appearance of Sputum		Bacteriologic Examination		Hemoptysis	Tubercle Bacilli	
Case	Early	Late	Early	Late			Comment
1. G. A.	Red, mucoid	Copious, foul purulent	Pure F.B.A.	F.B.A., pne., spiro., fus. b.	No	Neg.	Secondary anaerobic infection
2. A. H.	Red, mucoid	Thin, brown, foul	Pure F.B.	F.B., pne., staph. etc.	Several	Neg.	Lung abscess, bacteremia
3. D. U.	No sputum		Pure F B. isolated twice from empyema		No	.....	Subd. abscess (B. coli)
4. N. K.	Profuse, red, mucoid	Thick, brown	Not examined	F.B. pure growth	No	Neg.	.....
5. M. B.	Purulent, sometimes bloody	Thick, brown	Not examined	F.B. pure growth	Several	Neg.	Pure F.B. from empyema and lung abscess
6. A. W.	Thick, mucopurulent	Thick, brown	Not examined	F.B. pure growth	No	Neg.	Pure F.B. from pleural effusion
7. T. M.	Thick, mucoid, bloody	Thick, brown, foul	Not examined	F.B. pure growth	No	Neg.	Lung abscess
8. G. P.	Scanty, mucoid	None	Pure F.B.	.....	No	Neg.	Pure F.B. from pleural fluid
9. J. B.	Thick, brick-red, mucoid	Mucopurulent	Pure F.B.	F.B. and pne.	No	Neg.	.....
10. J. M.	Thick, brick-red, mucoid	Scanty	Pure F.B.C.	F.B. and pne.	Yes	Neg.	Bacteremia, 25 colonies
11. J. S.	Mucoid, yellow	Copious, mucopurulent	Pure F.B.A.	F.B.A., pne., staph., etc.	No	Neg.	Pure F.B.A. from lung juice
12. M. C.	Mucoid, bloody	Copious, mucopurulent	F.B.A., few staph-	F.B.A., pne., staph., etc.	Yes	Neg.	Lung abscess, pure F.B.A. obtained by bronchoscopy.
13. J. M.	Mucoid, bloody	Copious, mucopurulent	Pure F.B.B.	F.B.B., pne., staph., etc.	No	Neg.	Bacteremia
14. E. M.	Thick, yellow	Scanty, mucoid	F.B.A., pne.	F.B.A., pne. type X	No	Neg.	F.B.A. from empyema
15. J. A.	Copious, mucoid, red-brown	Copious, mucopurulent, brown	Pure F.B.A.	F.B.A. and pne.	Yes	Neg.	F.B.A. from empyema
16. A. G.	Scanty, salmon-colored	Thin, mucopurulent	Pure F.B.A.	F.B.A. staph., pne., strep., etc.	No	Neg.	Bacteremia
17. A. F.	Brown, mucoid	Green, mucopurulent	F.B.A., pne.	F.B.A., staph., pne., strep., etc.	No	Neg.	F.B.A. from lung abscess

For key to abbreviations see table 1.

rounded by a refractile zone representing the capsule. After mouse passage or culture in laboratory mediums there generally occurs a change in the morphology, and the rods become shorter and even coccoid.

Analysis of table 2 shows clearly that during the early stages of the infection the Friedländer organism will usually be found in pure culture in the sputum, though in some instances it may become contaminated with other bacteria from the upper respiratory tract. The most certain method of identifying the organism is to inoculate the peritoneal cavity of a white mouse with a saline suspension of the sputum and examine bacteriologically the peritoneal fluid and the heart's blood or the brain of the mouse within twelve to twenty-four hours. Furthermore, if a loopful of sputum is streaked on a blood agar plate, the great majority of the colonies will prove to be Friedländer bacilli. By either method, the Friedländer bacillus can thus be recovered in pure culture and the organism may be further identified by agglutination tests or by the capsule-swelling method as belonging to group A, B or C. In all but one of the cases, positive evidence was obtained by discovery of the Friedländer bacillus in the sputum on one or more occasions and in nine of the cases the organism was typed. In seven of these instances a type A bacillus was found, in one a type B organism was isolated, and in still another case type C was the responsible organism.

It should be emphasized here that in the later stages of the illness, if abscess or bronchiectasis becomes established in the involved lung, these mechanical defects offer a nidus for secondary infection. Also, owing perhaps to immune processes, there is frequently a diminution in the number and virulence of the Friedländer bacilli, which become overgrown with secondary invaders. The remaining Friedländer organisms may become so attentuated that they are not virulent for mice, and only culture on an agar pour plate will reveal their presence.

BACTERIOLOGY OF LUNG FLUID, PLEURAL FLUID AND SPUTUM OBTAINED BY BRONCHOSCOPY

Since the sputum may become contaminated by organisms from the upper respiratory tract, it is desirable, whenever possible, to secure material for culture from other sources. Lung suction was done in one patient. The Friedländer bacillus type A was recovered on three occasions from the lung fluid of this individual during a period of several months. On eight other patients thoracentesis was done because the clinical observations suggested fluid. In four cases thoracentesis yielded pus which was found to contain the Friedländer bacillus. In the four other cases a nonpurulent pleural effusion was withdrawn which in two of the cases contained the Friedländer organism and in the other two was sterile.

Bronchoscopy was performed on three patients. Culture of the sputum from the bronchus of the involved lobe yielded the Friedländer bacillus in each instance.

BACTEREMIA AND ITS RELATION TO MORTALITY

Blood cultures were made for thirteen patients of this series, several cultures usually being made in each case. As shown in table 3, only four patients had bacteremia; the blood stream of three of these was only mildly invaded and quickly became sterile, in one instance after sulfapyridine therapy and in another after the use of sulfanilamide. In one other nonfatal case as many as 25 colonies per cubic centimeter of blood were found. However, in this instance, the disease was due to a type C organism which apparently is less virulent than the more common type A.

Analysis of the data contained in table 3 discloses first a low mortality in the entire group of chronic Friedländer lung infections—23.5 per cent as compared with the 97 per cent mortality noted in the acute cases. Second, bacteremia is relatively infrequent in chronic Friedländer pneumonia, occurring in 31 per cent of

the cases as compared with 70 per cent in the acute group. Third, as in acute Friedländer pneumonia, the blood stream invasion is generally mild and does not apparently play an important role as a cause of death. The recent case report,[14] therefore, of a recovery from Friedländer bacteremia without pneumonia following sulfapyridine therapy should not be hailed with too great enthusiasm.

BLOOD CELL CHANGES

White cell counts were done in sixteen cases, in twelve of which serial determinations were made. The count ranged from 4,200 to 33,800. In the majority of the cases there was a moderate degree of leukocytosis during the acute phases of the illness. The highest count (33,800) was reached in a case complicated by both lung abscess and empyema. In only three cases was there a true leukopenia, which contrasts with the data in the previously reported acute group, in which leukopenia occurred at some stage during the period of observation in about one half of the cases. The percentage of polymorphonuclears varied from 32 to 96 per cent of the total, being usually elevated with a shift to the left in the Schilling index during the acute phase of the illness. The monocytes ranged from 0 to 20 per cent. There were five cases (31 per cent) in which the monocytes reached 6 per cent or more during the period of observation.

COMPLICATIONS

Complications were frequent, in fact almost universal, in this series and were in the main limited to the chest. Lung abscess was demonstrated roentgenologically in ten cases, death occurring in two of these during the period of observation. In four instances the diagnosis was confirmed at operation and in one at necropsy. Abscess formation was generally marked by a change in the character of the sputum, which became copious and mucopurulent but not, as a rule, foul.

In three of the cases of lung abscess there developed an encapsulated empyema from which in each instance the Friedländer bacillus was isolated in pure culture on one or more occasions. Empyema occurred in one other case, unassociated with lung abscess.

The pus in the empyema cases was thick, yellowish green or creamy; it contained a predominance of polymorphonuclear leukocytes and when first discovered yielded Friedländer bacilli in pure culture. Subsequently, in two of the cases other organisms were found, the assumption being that they were secondary invaders.

Pleural effusions of a serous nature were noted in four cases. In two of these the effusions were large, 1,500 cc. and 750 cc. of fluid respectively being removed by thoracentesis and in both cases yielding the Friedländer organism in pure culture. In the third case, the serous effusion was encapsulated and the fluid sterile. However, this patient showed lung abscess and loculated empyema in both of which the Friedländer bacillus was demonstrated. In the fourth case the effusion occurred two months after the onset of illness and was small in amount and sterile.

A rather frequent sequela was pulmonary fibrosis and delayed resolution, which was observed in four cases. In one instance this was associated with a purulent bronchiectasis as demonstrated in bronchograms (figs. 6 and 7).

14. Meyer, K. A., and Amtman, Leo: Treatment of Friedländer's Septicemia by Sulfapyridine with Recovery, J. A. M. A. **113**: 1641 (Oct. 28) 1939.

Severe hemoptysis was observed in only one case. Delirium occurred in only one case and was attributed to associated chronic alcoholism. Meningitis did not occur in this series. The unusual complication of axillary vein phlebitis occurred in two patients, being in both instances associated with abscess and encapsulated empyema on the same side. The phlebitis subsided in both cases after sulfapyridine therapy and surgical drainage of the chest, but in one case it was followed by an acute inflammatory arthritis of the wrist on the same side.

X-RAY STUDIES

It was possible in most of the cases of this series to obtain serial roentgenograms at various stages of the disease. The earliest changes noted are those of lobar or confluent lobular consolidation, followed in the majority of cases by abscess formation or by bronchiectasis. Pleural effusion either serous or purulent is common. There is frequently a considerable degree of pulmonary fibrosis as evidenced by x-rays. Lung abscesses, once established, tend to persist indefinitely if a fatal issue is avoided. Complete clearing, however, does occasionally occur.

Kornblum and his associates [11] describe four phases, as observed by serial roentgenograms: first, the stage of primary bronchopneumonia; second, coalescence to form a pseudo lobar pneumonia; third, pulmonary necrosis, and finally the formation of numerous irregular cavities of various sizes. While such a classification has the merit of convenience, it is by no means true that chronic Friedländer pneumonias necessarily follow this course. On the contrary, in many instances the early manifestations are those of a massive dense shadow in the involved lung, frequently suggestive of encapsulated fluid. Moreover, abscess formation is not universal, since in certain cases of acute Friedländer pneumonia there is recovery with complete clearing of the lesion as shown by roentgenogram. In the majority, however, abscesses, bronchiectasis or fibrosis develops and these latter changes may persist for years or even for the duration of the patient's life. It is not my impression that the roentgenologic changes at any stage in the course of this disease are by themselves pathognomonic, though serial roentgenograms when considered in conjunction with the history and clinical course are most helpful in pointing to the diagnosis.

TABLE 3.—*Relation of Bacteremia to Mortality*

Total number of cases	17
Deaths	4
Mortality rate	23.5%
Number of cases in which blood culture was done	13
Number of cases with bacteremia	4
Number of cases with bacteremia in which death occurred	0
Number of cases without bacteremia	9
Number of cases without bacteremia in which death occurred	2
Mortality rate of nonbacteremic cases	23%

DIFFERENTIAL DIAGNOSIS

During the acute stage, the disease resembles pneumococcic pneumonia with the exception that in a certain percentage of cases the sputum has the characteristics of the acute Friedländer pneumonia. There are other clinical differences, already enumerated, and careful bacteriologic study will conclusively distinguish this disease from the pneumococcic infections.

It is during the succeeding phases that an error is most likely to be made. If pulmonary suppuration

occurs and is followed by secondary anaerobic infection with the production of foul sputum, it usually leads to a diagnosis of putrid lung abscess. However, if the sputum is cultured by streaking on a blood agar plate or by mouse inoculation, it is possible correctly to reconstruct the pathogenesis of the illness. Fortunately, in most instances the pulmonary necrosis is nonputrid.

Perhaps the commonest mistake is to diagnose the condition as chronic pulmonary tuberculosis because of the bloody mucopurulent sputum and the x-ray appearance of an upper lobe lesion associated with cavities and pulmonary fibrosis with or without a certain degree of lung shrinkage. However, repeated examinations of concentrated specimens of sputum and guinea pig inoculation will not show tubercle bacilli. By detailed cultural analysis, it is generally possible to isolate the Friedländer organism in pure or mixed culture. In some cases the original organism may disappear, leaving behind merely cavities in one or more lobes. If there are no bacteriologic studies preceding this stage, it is impossible to prove the diagnosis. I have the impression that this is not uncommon.

In some instances, the disease has been mistaken for carcinoma of the bronchus. Bronchoscopic biopsy in such cases will reveal only granulation tissue, and further study of the sputum and the clinical course will demonstrate the true nature of the disease.

TREATMENT

Treatment of the acute illness was in most of the cases symptomatic, specific horse serum not being employed because of the disappointing results observed with its use in the acute disease.[1] Bed rest, expectorants and general nursing care constituted the main features of therapy. Complications were treated by the necessary special measures.

Of the ten patients with lung abscess, three were treated symptomatically with postural drainage and bronchoscopy. Two patients recovered and the third died. Two patients with lung abscess who received sulfapyridine and one who received sulfanilamide recovered. Four other patients with lung abscess, in three instances complicated by encapsulated empyema, were treated surgically. Two of them were given sulfapyridine and the lesions are still draining but the patients appear to be recovering. Of the two who did not receive sulfapyridine one died and the other still has a draining fistula.

Empyema occurred in four cases with the development of thick yellow pus which required thoracotomy with rib resection. Two of the patients, as already noted, were treated with sulfapyridine and recovered, and the two other patients died.

While each case should be considered on its merits, it is my impression that surgical drainage of Friedländer lung abscesses should be avoided whenever possible. The abscess will generally drain adequately through the bronchus, particularly if aided by postural drainage and repeated bronchoscopies. Moreover, in most cases the results with surgical therapy are not striking and the resultant fistulas seem to drain interminably.

As may be gathered from foregoing statements, four of the patients were treated with sulfapyridine. Two Gm. of the drug was given at the start, followed by 1 Gm. every four hours till improvement was noted. All four of these patients recovered, one of them despite the presence of bacteremia. It is difficult to evaluate the effectiveness of sulfapyridine with such a small number of cases, nor are there, to the best of my knowledge, any previous reports in the literature dealing with the use of sulfapyridine in this disease. The mortality rate in the untreated group was 31 per cent while none of the treated patients died, which in itself is encouraging. It would appear that the drug was most useful in permitting survival during the acute stage. There was, however, little other evident effect on the clinical course, since in three of the cases during the course of therapy suppuration and abscess formation occurred.[15] In the fourth, this process was already well established when treatment was begun. While the results with sulfapyridine are still inconclusive, one should, nevertheless, for the present accept the remedy as the most promising yet advanced for the treatment of this disease.

One bacteremic patient was treated with sulfanilamide, a total of 120 Gm. being administered. This man recovered and was discharged though he too had multiple lung abscesses.

REPORT OF CASES

The following six protocols are selected as best illustrating the salient features of the disease:

CASE 1.—G. A., a white man aged 48, became ill suddenly, being awakened by a sharp pain in the left chest with chills, fever and bloody sputum. When admitted to Bellevue Hospital, March 11, 1934, on the seventeenth day of disease, he appeared poorly nourished, dyspneic and acutely ill with consolidation of the left upper lobe. During the first ten days, several examinations of the sputum showed pure Friedländer bacilli type A, no tubercle bacilli being found. The sputum, at first mucoid and bloody, became abundant, foul and purulent by the twenty-ninth day owing to secondary anaerobic infection. The sputum retained this character throughout the remainder of the illness, with the quantity varying from 20 to 100 cc. in twenty-four hours.

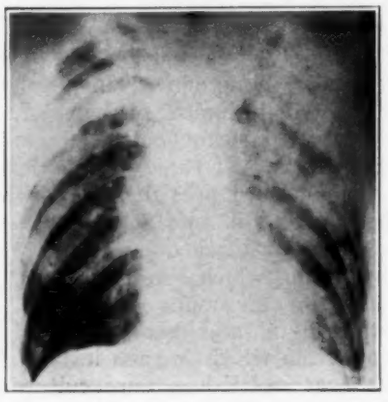

Fig. 1 (case 1).—The thirty-fourth day of disease, multiple abscesses of the left upper lobe with spread of infection to the right upper lobe.

Fluoroscopic study on the thirtieth day showed a lung abscess in the left upper lobe with a shifting fluid level. X-ray films four days later (fig. 1) showed multiple abscesses and a spread of the infection to the right upper lobe. The patient was examined by bronchoscope on the thirty-second day, and a large plug of thick foul mucopus was aspirated from the bronchus of the left upper lobe. Blood cultures were repeatedly sterile. The white blood cell count on the twenty-fifth day was 7,850 with 68 per cent polymorphonuclears and 32 per cent lymphocytes, and on the thirty-second day it was 4,700 with 32 per cent polymorphonuclears and 68 per cent lymphocytes. The temperature was irregular, ranging from 100 to 104 F. with marked diurnal variations in the last week of illness. Treatment consisted of postural drainage, intravenous guaiacol therapy and bronchoscopic procedure, but the patient failed to respond, death occurring on the thirty-sixth day of illness.

At autopsy the left upper lobe was gray and consolidated, containing a large multiloculated abscess 8 cm. in diameter and

15. Recently a woman aged 72 with Friedländer pneumonia of the right upper lobe was treated with sulfapyridine by Dr. H. K. Ensworth in the service of Dr. Asa Lincoln at Bellevue Hospital and made a complete recovery within ten days with no sequelae. Possibly the fact that treatment was begun only a few hours after onset contributed to her unusually favorable response.

partly full of green viscid pus, the wall being gray, necrotic and fibrous. The right upper lobe was consolidated, and both lower lobes were congested.

CASE 2.—J. S., a white man aged 72, awakened from sleep the morning before admission with fever, general malaise and cough with bloody phlegm. He was admitted Oct. 25, 1937, appearing acutely ill, dyspneic and cyanotic, with a fever of 103 F. and consolidation of the right upper lobe. A roentgenogram (fig. 2) taken October 27 showed irregular consolidation confined to the right upper lobe, as well as old pleural thickening and emphysema.

The sputum was thick, brown and mucoid, and a direct smear showed many gram-negative encapsulated bacilli (Friedländer). The sputum typing yielded Friedländer bacilli type A, and the sputum culture showed a predominance of Friedländer organisms with a few unclassified pneumococci. Lung suction with culture of the lung fluid yielded Friedländer bacilli type A in pure culture.

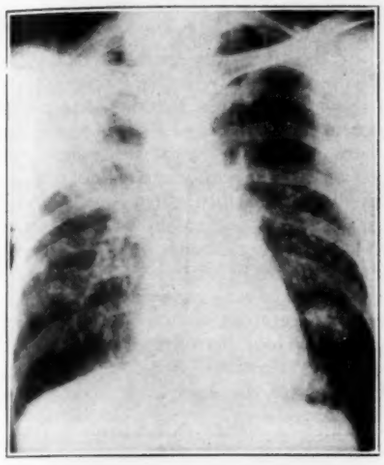

Fig. 2 (case 2).—Oct. 27, 1937, the second day of illness, Friedländer pneumonia in the right upper lobe.

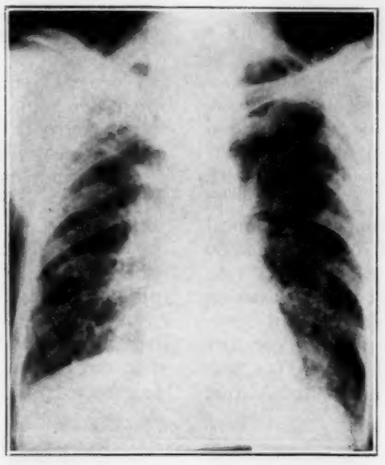

Fig. 3 (case 2).—November 22, showing considerable resolution.

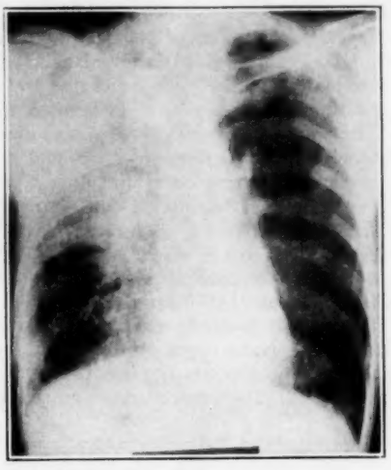

Fig. 4 (case 2).—Feb. 3, 1938, fresh consolidation in the right upper lobe.

The patient was treated symptomatically and in three days the temperature fell by crisis. However, he continued to raise a green, mucopurulent sputum which remained negative for tubercle bacilli and still contained the Friedländer bacillus as the predominant organism. A roentgenogram taken November 22 (fig. 3) showed considerable clearing of the pneumonia. He was discharged December 1 to a convalescent home, although his lesion had not completely resolved.

He was readmitted Feb. 3, 1938, stating that in the interval he had been troubled by dull pain in the right side of the chest and cough with copious green sputum. Three days before his readmission he had chills and a sudden rise in fever. He was again acutely ill and dyspneic with a temperature of 103 F. and the classic signs of consolidation. On the following day the temperature fell to 99 F. A roentgenogram taken February 3 (fig. 4) showed consolidation of the right upper lobe.

The sputum typing on two occasions showed a predominance of Friedländer bacilli type A, and a few pneumococci. Numerous examinations of concentrated specimens of sputum yielded no tubercle bacilli. Lung section was performed February 11, yielding the Friedländer bacillus type A and a few contaminants (staphylococci).

Serial x-ray studies, of which figure 5 (March 2) is representative, showed progressive clearing of the lesion. Because of continued expectoration of considerable mucopurulent sputum a bronchogram was made, which showed a normal bronchial tree in the lower lobes. However, the bronchogram of the right upper lobe (figs. 6 and 7) showed bronchiectasis in the posterior portion of the right upper lobe. The patient was discharged April 15, with residual signs of infiltration in the right upper lobe and is still under observation in the chest clinic of the Fourth Medical Division of Bellevue Hospital. There is dulness over the right upper lobe but no rales. A roentgenogram made Nov. 3, 1939 (fig. 8), shows infiltration and residual iodized oil in the right upper lobe. He raises several ounces daily of thick mucopurulent sputum which is consistently negative for tubercle bacilli. Culture of the sputum on several occasions has yielded Friedländer bacilli type A mixed with other organisms (streptococci, staphylococci and diphtheroids). The symptoms mentioned, however, are not troublesome and he is able to continue in his occupation as an orderly.

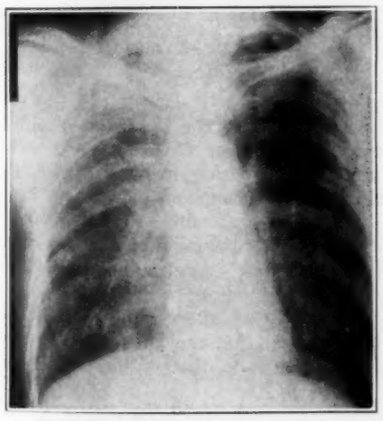

Fig. 5 (case 2).—March 2, partial resolution.

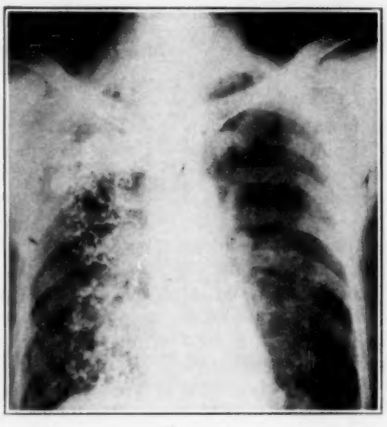

Figure 6.

Figure 7.

Figs. 6 and 7 (case 2).—March 8, bronchogram demonstrating bronchiectasis of the right upper lobe.

CASE 3.—M. C., a white man aged 50, had a respiratory infection in May 1938. A routine roentgenogram (fig. 9) in the clinic showed no disease of the lungs.

June 10, 1939, he had a sudden sharp pain in the right side of the chest, chills and fever, and raised mucoid bloody sputum. He was admitted June 18, appearing acutely ill with a fever of 103 F. There was dulness in the upper third of the right side of the chest with suppressed breath sounds and a few fine moist rales. The rest of the examination was negative except for moderate enlargement of the liver, attributed to fatty degeneration because of the history of alcoholism. June 19 a roentgenogram (fig. 10) showed a large wedge-shaped area of consolidation in the midzone of the right lung, and the lateral view showed this lesion to be limited to the right upper lobe.

The sputum was thick, brown and mucoid and when cultured showed a preponderance of Friedländer bacilli with also some staphylococci, streptococci and a few unclassified pneumococci. However, when inoculated into a mouse, a pure culture of Friedländer bacillus type A was recovered from the peritoneal cavity and the brain of the mouse. This was repeated June 20 and the Friedländer organisms and a few pneumococci type XI were recovered from the peritoneal cavity of the mouse. July 11, bronchoscopic examination revealed an inflamed bronchus in the right upper lobe with a large amount of non-foul mucopurulent sputum coming from this bronchus. This was not cultured. The bronchoscopic procedure was repeated August 4 with the aspiration of scanty thick sputum from the bronchus of the right upper lobe; on culture this yielded pure Friedländer bacillus type A. Bronchoscopy and culture of the material obtained were done one week later with the same result.

The clinical course was severe during the first two weeks. There were signs of consolidation of the right upper lobe and an x-ray film June 23 (fig. 11) showed a dense homogeneous shadow with a convex lower border as if there might be an encapsulated effusion. Exploratory thoracentesis yielded no fluid.

Sulfapyridine was employed, 1 Gm. being given every four hours for ten days, after which the temperature came down by lysis and the drug was discontinued. He received a total of 55 Gm. No toxic symptoms were noted.

The white cells on admission numbered 13,200 with a shift to the left. Within a few days the count rose to 22,750 with a greater shift to the left. Following this there was a gradual fall in the white cell count. The red cells and hemoglobin were moderately low on admission and did not rise till after the acute phase passed. The erythrocyte sedimentation rate (Westergren) averaged 40 mm. during the acute stage of the illness and gradually came down to normal.

Serial x-ray studies (figs. 12 and 13) showed abscess formation with fluid level although the sputum was never foul. There was gradual clearing of the pneumonic zone surrounding the abscess. Agglutinins against the Friedländer bacillus type A appeared in the blood. The cavity decreased in size progressively, and the roentgenogram made October 23 showed merely an area of infiltration in the second and third right interspaces which may represent either a residual cavity or bronchiectasis (fig. 14). The patient was asymptomatic, and he was discharged to a convalescent home. He was seen again Jan. 20, 1940, and the roentgenogram, not reproduced here, showed no appreciable change.

CASE 4.[16]—J. M., a 41 year old white man, became ill six days before admission with an infection of the upper respiratory tract, followed by sharp pain in the right side of the chest and blood-streaked sputum. He was admitted Nov. 2, 1939, appearing acutely ill with a temperature of 104 F. The sputum was the characteristic mixture of mucus and blood. There was consolidation of the right upper lobe (fig. 15).

The patient was icteric; the liver was enlarged and ascites was present. Dr. William Asterid, who had observed this patient for some years previously, stated that the diagnosis of hepatic cirrhosis had been made in 1935 and that up to the time of the present illness there was no pulmonary disease.

The sputum on admission and several days later showed a pure growth of the Friedländer bacillus type B. The blood culture made on admission showed one colony of this bacillus. The cultures November 4 and 5 were sterile but on November 6 there was again a growth of the Friedländer bacillus type B in the broth despite the fact that he was receiving sulfapyridine.

Sulfapyridine therapy was begun on admission, 2 Gm. being given at once and 1 Gm. every four hours until November 13, when the dose was halved and continued for four more days. He received a total of 80 Gm. of the drug.

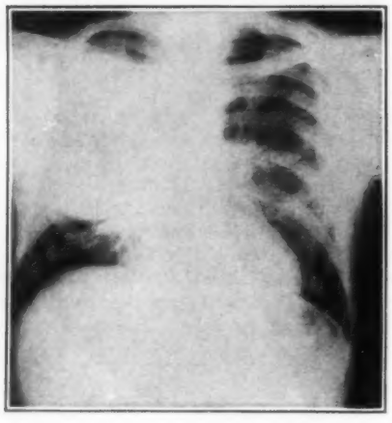

Fig. 11 (case 3).—June 23.

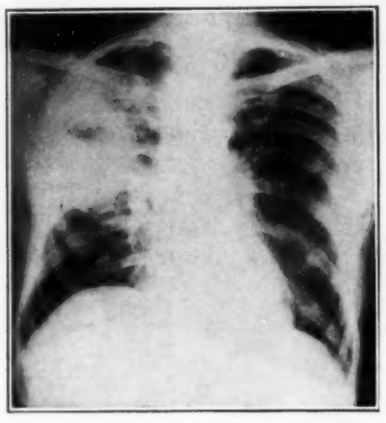

Fig. 12 (case 3).—July 7, abscess with a fluid level.

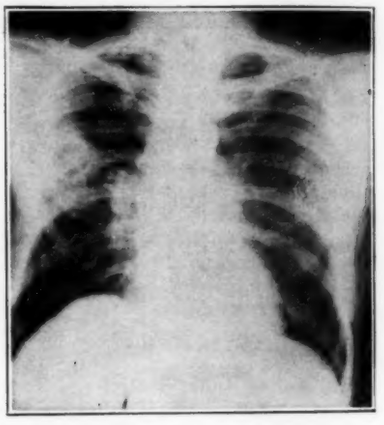

Fig. 13 (case 3).—August 31, clearing of the pneumonic zone. The abscess is large but empty.

The patient gradually improved and the temperature fell by lysis November 5, although he appeared toxic for some weeks after. The pneumonic area began to slough out and a definite lung abscess developed in the periphery of the second interspace (fig. 16). The character of the sputum changed, becoming copious and mucoid and containing mixed organisms as well as the Friedländer bacillus. Agglutinins against the Friedländer type B organism were present November 6 and persisted for several weeks. It is of interest that for a short time agglutinins were also present for the pneumococcus type II, whose capsule is closely related to that of the Friedländer type B organism.

The white cells on admission numbered 4,200 with a marked shift to the left, but within a few days the count rose to 23,000 and then leveled off at 14,000 with a normal differential count.

A complicating factor was the presence of cirrhosis of the liver with ascites. Abdominal paracentesis was done and 5 quarts of fluid removed. The small abdominal incision necessary for this procedure remained patent and drained for weeks. The edges of the wound appeared necrotic and devitalized, though not infected. It was assumed that this was a sulfapyridine effect on the tissues, since a similar phenomenon was observed in another patient (not in this series) who after a laparotomy contracted pneumonia and was treated with sulfapyridine. The operative wound appeared devitalized and dehiscence occurred with evisceration and a subsequent fatal outcome.

16. Dr. Asa Lincoln gave permission to present this case.

Later roentgenograms (fig. 17) show considerable clearing of the lesion and shrinkage of the lung abscess. It seems likely now that he is recovering from his pulmonary infection, although the associated portal decompensation appears serious.

CASE 5.—E. M., a 46 year old white woman, gave a history of several attacks of pneumonia during the past ten years. During one of these attacks of which there is record, in 1931 she had pneumonia of the left upper lobe which cleared up spontaneously. No sputum typing was done. She subsequently complained of chronic cough and was observed in the clinic of New York Hospital in 1934. The sputum was not examined, but a roentgenogram was taken which showed increased bronchial markings. Neither this picture nor the ones taken at Bellevue Hospital are shown here because of lack of space.

She was admitted to Bellevue Hospital Nov. 30, 1939; there had been an acute onset one month before with shaking chills, pleuritic pain and the production of thick yellow sputum.

She appeared acutely ill with a fever of 104 F., consolidation of the left upper lobe and empyema necessitatis in the left axilla. There was also swelling of the left arm with a tender cord in the axilla which was believed to be a thrombophlebitic axillary vein.

The roentgenogram showed consolidation of the left upper lobe and encapsulated empyema. Thoracentesis yielded 30 cc. of thick creamy pus which showed Friedländer bacilli type A in pure culture. The sputum was also thick and creamy and showed a predominance of gram-negative rods in the direct smear. Sputum typing showed the Friedländer bacillus type A and pneumococcus type X. The white cells numbered 22,000 with 90 per cent polymorphonuclears. The blood culture was sterile.

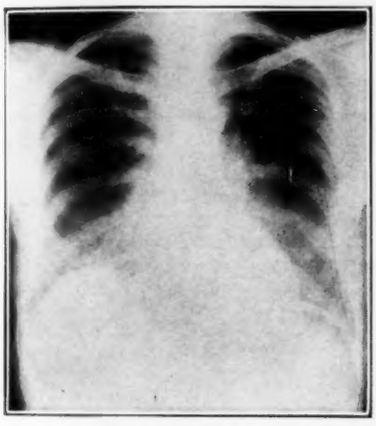

Fig. 14 (case 3).—October 23, shrinkage of the abscess and residual infiltration.

Thoracotomy was done December 2 with resection of a piece of the second rib and drainage of the empyema as well as the lung abscess in the left upper lobe. A bronchopleural fistula was noted.

Sulfapyridine was started on admission, the same dosage being employed as in case 3. The temperature fell to 100 F. December 1, although low grade pyrexia persisted for some time thereafter. The thrombophlebitis subsided. The patient is still in the hospital at the time of writing. Although she has shown considerable clinical improvement, she still has a draining fistula and a residual abscess in the left upper lobe.

CASE 6.[17]—A. G., a white man aged 50, became ill Oct. 6, 1938, with weakness, vomiting, chills, pain in the right side of the chest and cough with scanty salmon-colored sputum.

The patient was acutely ill and dyspneic on admission October 10, and there were signs of pneumonia in the right upper lobe, which was confirmed by x-rays. The temperature was not high, ranging between 100 and 102 F. Sputum typing and sputum culture at first yielded a pure growth of Friedländer bacilli, although the type was not determined. Later in the course of the disease the Friedländer organism was found in the sputum only in association with streptococci, staphylococci and other organisms. The blood culture on admission showed one colony of Friedländer bacillus. Subsequent cultures were sterile.

Sulfanilamide was employed, 1.3 Gm. being given every four hours, and this was maintained for three weeks until a total of 163.8 Gm. had been administered.

17. Dr. James Liebman gave permission to present this case.

Serial roentgenograms showed unresolved consolidation of the right upper lobe with several cavities. The temperature fell by lysis, reaching normal October 16, although there was little clearing of the pneumonic lung. The white cells numbered 7,400 on admission and gradually rose to 27,400 after two weeks, with a subsequent slow fall in the count.

The patient was discharged December 14, still showing infiltration and cavities in the right upper lobe. He is observed in the clinic at intervals and complains of cough and mucoid sputum. Culture of the sputum on agar pour plates Jan. 5, 1940, yielded Friedländer bacilli type A and numerous other organisms. A roentgenogram taken Nov. 25, 1939, still showed productive changes and cavities in the involved lobe.

SUMMARY

1. Seventeen cases were observed of chronic pneumonia due to the Friedländer bacillus, a clinical condition which is rather unique in a number of ways. Generally following on the heels of the acute disease, the chronic infection lasts for months or years if a fatal issue is avoided.

2. The causative organism was isolated in pure culture in every case during life from one or more of the following sources: sputum, pleural fluid, lung fluid and blood.

3. The disease is more common in males, it occurs mainly in the fifth and sixth decades of life, and the chronic form has never been observed in childhood.

4. The onset of the illness is usually acute, the disease after a few weeks assuming the features of chronicity. The temperature is irregular, febrile periods often alternating with periods of normal temperature. In this series, the disease lasted from one month to more than three years. The mortality was 23.5 per cent.

5. Bacteremia occurred in 31 per cent of these cases as compared with an incidence of 70 per cent in the acute Friedländer pneumonia. However, in both groups of cases, the degree of blood stream invasion is mild and does not play any apparent role in the cause of death.

6. The upper lobes were the most favored sites, being involved in 82 per cent of the cases. Multiple lobe involvement was present in 30 per cent of the cases.

7. The sputum is often characteristically mucoid and bloody in the early stages, later becoming mucopurulent if suppurative changes occur. A direct smear of the sputum frequently reveals typical large encapsulated gram-negative bacilli. Mouse inoculation early in the illness generally yields a pure culture of the Friedländer organism. The bacilli may be further classified by agglutination tests and the capsule-swelling method into groups A, B, C and D. Nine of our cases were so typed, revealing seven cases of type A, one of type B and one of type C.

During the later stages of the disease, the Friedländer organism is no longer present in pure culture but is found mixed with or overgrown by secondary invaders.

8. Complications were chiefly limited to the chest and included lung abscess, bronchiectasis, pulmonary fibrosis, pleural effusion and empyema. Of these, the most frequent were lung abscess, occurring in almost 60 per cent of the cases, and empyema, which occurred in 23.5 per cent of the cases. In three of the four fatal cases there was lung abscess or empyema or both.

9. Because of the frequent occurrence of blood streaking and mucopurulent sputum and the x-ray appearance of upper lobe cavities, the condition, if the patient is seen for the first time at this stage, is commonly mis-

diagnosed as pulmonary tuberculosis. However, a careful evaluation of the history, clinical evidence and bacteriologic study of the sputum will reveal the true nature of the disease.

10. Sulfapyridine was employed with four patients, all of whom recovered though pulmonary suppuration continued with little apparent effect. One bacteremic patient was treated with sulfanilamide and recovered, though he too contracted lung abscesses.

This is the first report in the literature dealing with the use of sulfapyridine in this disease. Despite the fact that the number of cases reported here is not large the results are sufficiently encouraging to warrant further trial of sulfapyridine in Friedländer infections of the lungs.

162 West Fifty-Fourth Street.

LEAD ABSORPTION FROM BULLETS LODGED IN TISSUES

REPORT OF TWO CASES

WILLARD MACHLE, M.D.
CINCINNATI

Whether bullets remaining in tissues can give rise to lead poisoning has long been a subject of discussion. The great body of opinion, first expressed by Paré, holds that bullets in tissues will not cause intoxication, but there have also been proponents of the opposite point of view, and cases of plumbism from retained bullets have been reported from time to time, the earliest record being that of Bronvin [1] in 1867. Among the more than fifty publications on this subject there are reports of forty cases in which the clinical diagnosis of plumbism resulting from retained bullets has been made.[2]

The entire assumption of the occurrence of plumbism from retained bullets being dependent on the occurrence of clinically identifiable lead poisoning, it would seem desirable at the outset to state the criteria on which my associates and I base such a diagnosis. They are the existence of (1) significant lead absorption, as evidenced by the presence of abnormal amounts of lead in the body fluids or tissues, (2) clinical signs and symptoms consistent with lead intoxication and (3) other laboratory observations that will support the diagnosis.

Analytic evidence of significant lead absorption, while not a sine qua non for diagnosis, affects the likelihood of the existence of intoxication so markedly that in practically all instances quantitative data on the lead content of the urine and blood are most desirable. Unfortunately, when most of the cases were recorded precise analytic methods were not available and the data on which the diagnosis of plumbism was based were not quite complete. Furthermore, as a consequence of the development of adequate procedures for lead analysis refinements in the diagnosis of plumbism have been made, and the significance of clinical symptoms and signs is now subject to somewhat more critical interpretation. For example, the presence of a lead line and the occurrence of stippling in the erythrocytes may now properly be regarded as evidences of lead absorption alone, with no certainty that intoxication exists.

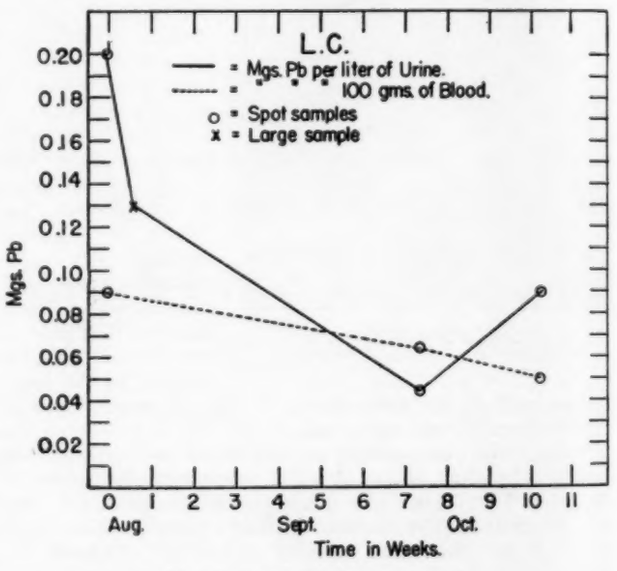

Fig. 1.—Lead excretion in case 1.

Obviously many persons have carried bullets about in their bodies for decades without acquiring plumbism. Lead bullets are not in all cases inert, however. In our cases [3] determination of concentrations of lead in the urine and blood demonstrated that lead absorption of a magnitude comparable to that encountered in lead trades can result from embedded bullets. Furthermore, in one case with removal of the bullet and excision of contaminated tissues the abnormal absorption stopped and the concentrations of lead in the urine were reduced:

CASE 1.—L. C., a man aged 27 first seen in the orthopedic service at the Cincinnati General Hospital, had carried a pistol bullet in the head of the right femur for some six or seven years. In the interval the patient had not been well. Local

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From the Kettering Laboratory of Applied Physiology, University of Cincinnati.

1. Bronvin, de Sion: Etiologie de la colique de plomb, Union méd., Paris **3**: 89, 1867.

2. The cases summarized in table 1 comprise the original clinical reports and are arranged in chronological order. The references not given elsewhere in the paper are as follows:

Stüve and Grossheim: Halbseitige Lähmung nebst dem seltenen Falle einer seit 26 Jahren in der Tibia festsitzenden Gewehrkugel, J. d. Chir. u. Augenh. **1**: 142, 1827; cited by Küster and Lewin.[9]

Pluskal, F. S.: Vergiftungsfälle nach dem Anschiessen mit Bleischrot, Oesterr. med. Wchnschr., 1843, No. 19, pp. 505-507; cited by Küster and Lewin.[9]

Simon, Gustav: Ueber Einheilung von Gewehrkugeln in spongiösen Knochen, Vrtljschr. f. d. prakt. Heilk. **1** (pt. 1): 164, 1853; cited by Küster and Lewin.[9]

Vučetič, Nicolaus: Ein Bleiprojectil durch 18 Jahre und 2½ Monate festgekeilt im Knochen mit resultierender chronischer Bleivergiftung, Allg. wien. med. Ztg. **42**: 221, 1897.

Nimier and Laval: Accidents d'intoxication déterminés par la rétention de projectiles en plomb, Caducée **1**: 53-58, 1901.

Sabrazès: Proc. verb. Société linéenne de Bordeaux, January 1901.

Choyau, cited by Mabit, Augustin: De l'intoxication saturnine causée par le plomb introduit à doses massives dans l'économie et séjournant soit dans les voies digestives, soit dans l'épaisseur des tissus, Thesis, Paris, No. 269, 1902.

Elkonin, Jacob: Ueber Bleivergiftung nach Schussverletzungen, Thesis, Königsberg, O. Kümmel, 1907.

Monatsh. d. deutsch. Jagdschutzver.; cited by Elkonin.

Ribierre and Flandin: Intoxication saturnine liée au séjour dans l'organisme de grains de plomb provenant d'un coup de feu, Bull. et mém. Soc. méd. d. hôp. de Paris **28**: 813-825, 1911.

Curtillet, J., and Lombard, P.: Intoxication saturnine aiguë, mortelle, consécutive à un coup de feu par arme de chasse, Lyon chir. **7**: 393-402, 1912.

Roux de Brignoles, G.: Intoxication saturnine par balle de revolver séjournant depuis vingt ans dans la paroi thoracique, Marseille méd. **50**: 553-557, 1913.

Haagen, W. W.: Ueber "Bleivergiftung nach Steckschüssen," Deutsche Ztschr. f. Chir. **215**: 39-47, 1929.

Klein, F.: Ueber Bleivergiftung, unter besonderer Berücksichtigung einer solchen nach einem Herzsteckschuss, Arch. f. Psychiat. **94**: 128, 1931.

Neumann, Hugo: Ueber Steckschüsse mit nachfolgender Bleivergiftung, im Vergleiche mit anderen Steckschüssen und Fremdkörpern, insbesondere solchen der Nase, Monatschr. f. Ohrenh. **67**: 402-409 (April) 1933.

de Savitsch, Eugène: Un cas de saturnisme chronique tardif, suite de blessures de guerre (fragments de grenade) ayant simulé, successivement, une sclérose en plaques, puis une polynévrite avec ulcère peptique, J. belge de neurol. et de psychiat. **38**: 32-38 (Jan.) 1938.

3. These cases were referred to us by Dr. Joseph A. Freiberg, director of the orthopedic service of the Cincinnati General Hospital, who performed the operation in case 1.

symptoms were severe, and dizziness, headache and malaise had become increasingly noticeable during the past year. At the time we examined him the clinical picture did not seem sufficiently characteristic to justify a diagnosis of incipient plumbism, especially in view of co-existing marked gingival and tonsillar infection.

Samples collected on the day prior to operation contained 0.20 mg. of lead per liter of urine and 0.09 of lead per hundred

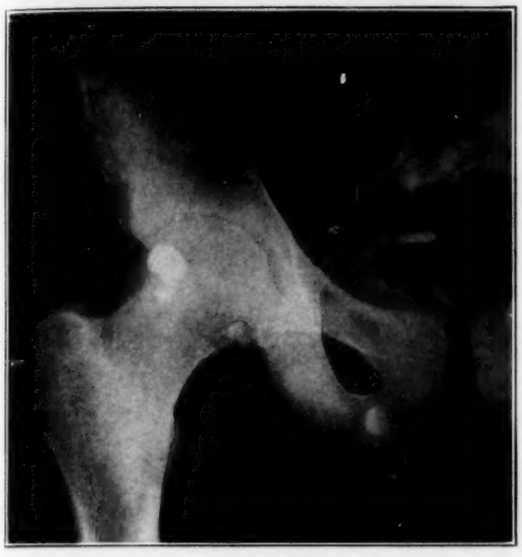

Fig. 2 (case 1).—Appearance in 1934, soon after the wound had been sustained.

grams of blood. These levels are significantly elevated and are comparable to those encountered in subjects with severe industrial exposure associated with intoxication. The bullet and contaminated tissues were removed and a vitallium cap was inserted. Subsequent samples, as shown in figure 1, revealed a steady decrease in the lead concentration in the blood

Fig 3 (case 1).—Appearance in 1939, prior to operation.

and variable lower levels in the urine, both tending downward though not reaching normal ranges in the ten weeks following operation. In view of this reduction in the lead concentrations after removal of the bullet and the absence of any known lead exposure prior to operation, we attributed the lead absorption to the bullet. Three roentgenograms (figs. 2, 3 and 4) taken shortly after the injury, just before operation and following operation demonstrate the solution and local dissemination of substance from the bullet, the degree to which the joint capsule and adjacent tissue were infiltrated with lead [4] and finally the extent of removal.

CASE 2.—C. B. was wounded by a pistol bullet in the right wrist. The embedded bullet caused deformity and impaired function but there were no general symptoms indicating lead intoxication. Roentgenograms taken shortly after the wound was sustained (fig. 5) showed the clearly defined foreign body with but little shattering of the deformed projectile. The second film (fig. 6) made seven weeks later already showed some evidence of beginning solution. In the last roentgenogram (fig. 7), five years later, evidences of solution and local deposition of lead were distinct. The concentrations 0.07 mg. per hundred grams in the blood and 0.07 mg. per liter in the urine were definitely higher than those of normal persons. Since an operation has not yet been performed I cannot report on the behavior of the lead concentrations following removal of the apparent source of absorption.

The analytic and x-ray studies in these two cases leave little doubt that under certain circumstances lead in retained bullets is acted on by the tissues and made available for absorption into the general metabolism. This observation has been made earlier. Two cases of

Fig. 4 (case 1).—Appearance after operation.

Wieting and Ibrahim [5] showed x-ray evidence of local dissemination more extensive than that seen in our cases; despite which there were no clinical symptoms or evidences of lead absorption. In the case of lead intoxication reported by Haenisch,[6] roentgenograms with an interval of twenty-two years demonstrated a similar behavior. Furthermore, in at least fifteen of the reported cases of plumbism from bullets there was evidence of local dissemination in the bluish gray discoloration of adjacent tissues similar to that seen in our case. The presence of crystalline deposits of what seemed to be metallic particles in adjacent tissues led some observers to conclude that the local dissemination and discoloration had resulted from comminution of the projectile. Study of roentgenograms from our cases and others in which serial pictures were taken indicates that, even though fragmentation is of importance in that it increases the surface available for solution, it is not alone responsible for the local changes.

It is known that lead compounds are soluble in the tissues and body fluids; moreover it has been shown

4. A portion of the joint capsule on analysis was found to contain more than 3 per cent of lead.

5. Wieting and Ibrahim, Effendi: Bleiresorption aus steckengebliebenen Projektilen, Deutsche Ztschr. f. Chir. **104**: 165, 1910.

6. Haenisch, G. F.: Ueber die Bleivergiftung bei Steckschuss, Fortschr. a. d. Geb. d. Röntgenstrahlen **53**: 484-489 (March) 1936.

TABLE 1.—*Abstract of Reported Cases*

Author	Date	Location	Type of Missile	Shattered	Interval to Onset	Spread	Other Diseases	Vomiting	Constipation	Colic	Stippling	Lead Line	Arthralgia	Wrist Drop or Central Nervous System Symptoms	Tremor or Sensory Disturbances	Lead in Urine	Anemia	Interval to Operation	Recovery	Notes
Bronvin [1]	1867	Hand and forearm	3 No. 5 buck shot	..	7 weeks	..	.....	..	+	+	..	+	..	.....	..	..	..	9 weeks	Incomplete 3 months	Two shots removed
Ellis [25]	1874	Condyle, femur *	Bullet	..	12 years	+	.....	+	+	+	..	+	..	Convulsions, delirium	..	..	..	.....	.....	Bullet worn
Küster and Lewin [9]	1892	Knee joint, tibia *	.....	+	18 years	+	Arthritis, fistula	..	+	+	..	±	..	—	+	+	+	.....	3 years	.....
Stüve and Grossheim [2]	(1827)	Marrow, right tibia	Bullet	..	26 years	+	Asthma, cerebral hemorrhage	..	+	..	..	..	..	Hemiplegia +	+	..	..	.....	Died—12 days	Cerebral hemorrhage
Pluskal [3]	(1843)	Thigh and femur *	90 bird shot	..	.....	..	Fistula †	..	..	+	..	..	..	.....	..	..	..	.....	.....	Weakness, cough and chest pain
Pluskal [3]	(1843)	Femur *	Bird shot	..	.....	..	Fistula †	..	..	+	..	..	..	.....	..	..	..	.....	.....	Febris lenta
Simon [3]	(1853)	Head of humerus *	Bullet	..	45 years	+	Alcoholism †	..	..	..	..	....	..	Amentia	..	..	..	.....	.....	.....
Vučetič [3]	1897	Condyle, femur	Bullet 2 cm.	+	18 years	..	2 fistulas	..	+	+	..	+	..	.....	..	..	..	18 years	6 months	.....
Nimier and Laval [3]	1901	Bones of hand	Bird shot 1.6 Gm.	+	4 weeks	..	2 fistulas	+	..	+	..	+	..	+	..	..	..	4 months	2 months	+
Sabrazès [3]	1901	Arm	Shot (bird ?)	..	.....	..	Gas bacillus infection	..	..	..	+	..	..	.....	..	..	..	.....	.....	.....
Choyau [3]	1901	Temporal bone	Bullet	..	2 years	..	Kidney stone	+	..	+	..	—	"Lead" gout	.....	..	—	+	.....	6 years	.....
Lewin [14]	1907	Head and shoulder	300 bird shot	..	8 months	..	Epilepsy	..	..	..	..	..	..	Dementia and convulsions	+	..	..	.....	.....	Post-traumatic epilepsy
Elkonin [3]	1907	.....	150 bird shot	..	5 years	..	.....	—	—	—	—	—	—	—	—	±	..	.....	.....	.....
Monatsh. d. deutsch. Jagdschutzvereins (cited by Elkonin [3])	(1903)	Both tibias	Bird shot	..	3 weeks	..	.....	..	..	+	..	+	+	.....	+	..	..	.....	.....	.....
Ribierre and Flandin [3]	1911	Lung and thorax	250 bird shot	..	3 months	—	Fistula †	+	+	+	+	..	..	+	+	—	3,390,000	.....	+ Incomplete	Encapsulation
Curtillet and Lombard [3]	1912	Forearm	Bird shot	..	12 days	+	.....	..	..	+	+	—	..	Stupor	..	..	2,800,000	.....	Died, 10 hr. postoperatively	Gangrene muscle
Roux and Brignoles [3]	1913	Chest wall	Pistol bullet	..	20 years	..	Aortic disease	—	+	..	..	—	..	.....	..	..	..	.....	1 year	.....
Neu [18]	1915	Vertebrae	Shrapnel	..	3 months	..	.....	..	..	+	..	..	+	.....	..	±	..	.....	.....	.....
Neisser [21]	1917	Chest	Shrapnel	..	6 weeks	..	.....	..	..	..	—	—	+	"Lead" neurasthenia	..	±	—	.....	.....	.....
Neisser [21]	1917	Thigh and calf	7 buck shot	..	25 years	..	Arthritis	..	..	..	—	..	"Lead" gout	.....	..	..	..	.....	.....	.....
Schlesinger [22]	1918	Face	.....	..	.....	..	.....	..	..	..	..	..	..	—	+	—	..	.....	.....	Lead in spinal fluid
Schlesinger [22]	1918	.....	Pistol bullet	..	25 years	..	.....	—	—	—	—	—	+	—	—	+	—	.....	.....	Lead in spinal fluid, 6 mg. per liter
Curschmann [24]	1918	Head of femur	Bullet	+	1 year	+	Pyelitis, duodenal ulcer, nephritis	..	+	+	+	+	..	Deltoids weak	..	0.2 Gm.?	3,200,000	1 year	Died 3 days postoperatively	Encephalopathy ?
Curschmann [24]	1920	Lung	Bullet	..	.....	..	Gastric ulcer	..	+	..	..	..	..	.....	..	..	+	.....	.....	.....
Habs [20]	1927	Ischium	Rifle ball	+	41 years	+	Fistula, arthritis	..	..	..	..	+	+	.....	..	..	..	22 years	?	.....
Habs [20]	1927	Head of femur *	Rifle ball	—	10-12 years	+ capsule	Ankylosis †	..	..	+	600/M	+	+	—	+	—	+	Hb. 60%	12 years	.....
Haagen [3]	1929	Left knee *	Bullet	+	22 years	..	†	..	..	..	±	±	..	Ataxia + memory loss	+	—	+	—	+	Dementia paralytica, Wassermann negative
Klein [3]	1931	Myocardium	Shrapnel	..	4-16 years	..	Neurasthenia	..	..	..	4,000	—	+	Vertigo and neurosis	+	..	Hb. 58%	.....	.....	0.15 blood

that the solubility of metallic lead is greater in fats and biologic fluids than in water, particularly in the presence of higher tensions of carbon dioxide.[7] This indicates how metallic lead in the tissues may serve as a source of lead absorption; it does not, however, elucidate the mechanism of the local redeposition. This may result from chemical differences between healing wounds and adjacent uninjured tissues. That mechanical factors such as abrasion may accelerate solution of the projectile is illustrated in the case of Kohlschütter,[8] in which the shrapnel bullet was embedded in the lateral fossa of the articular surface of the tibia exposed to joint action. In five years there was considerable loss of material from the bullet and extensive deposits about the knee joint, the popliteal bursa being filled with a frothy grumous gray mass and the joint capsule and cartilage colored a bright blue. In our first case the bullet was exposed on the head of the femur and showed wear from action of the joint.

A study of the reported cases was undertaken in an attempt to estimate the importance of any other factors

TABLE 2.—*Summary of Forty Reported Cases*

Interval to onset	12 days to 48 years; less than 1 year, 12; 1 to 10 years, 5; 10 or more years, 17 (6*)		
Location of missile	Bone and joint, 24; soft tissue 13 (3*); bathed with synovia, 8		
Type of missile	Bullet 19, shot 11, shrapnel 7 (3*)		
	Present	Absent	No Information
Dissemination	15	1	24
Associated diseases	26	1	13
Vomiting, constipation or colic	26	2	12
Arthralgia, paralysis or central nervous system symptoms	28	1	11
Lead line	15	8	17
Stippling	14	5	21
Anemia	12	4	24
Lead in urine	Significant concentration 2, present (qualitative) 9, absent 3 (26*)		
Recovery	Complete 11, partial 2, died 5 (22*)		

* Number of cases in which there was no information.

which might influence absorption. Details of the cases are given in table 1 and a summary of the significant observations in table 2.

As far as I have been able to determine, these forty cases comprise all the published cases of lead poisoning from bullets lodged in tissues. One is impressed first of all with the paucity of cases as compared to the frequency both of gunshot wounds and of bullets that have been permitted to remain in the body. I took as my criterion for inclusion in this study the fact that a clinical diagnosis of lead intoxication had been made by the respective author, without regard to the probable validity of the diagnosis. Exceptions are the six cases reported by Lewin in 1892, when Küster and Lewin[9] first interested themselves in this problem. These had been reported by other authors; Lewin averred that lead intoxication had been responsible for the symptoms in each case but had been overlooked.

It is apparent that plumbism was not associated with any particular type of missile. Under the heading

7. Clague, T. M., and Watson, A. J.: Experiments on the Solubility of Plain Lead and Antimonial Lead (with Reference to Retention of Shrapnel in the Body), Brit. M. J. **2**: 757 (Dec. 8) 1917. Oliva, Carlo: Studio sperimentale della intossicazione da piomo consecutiva a ferite d'arma da fuoco da caccia, Clin. chir. **21**: 1981-2002, 1913.

8. Kohlschütter, Reinhard: Die Gefahr der Bleivergiftung durch steckengebliebene Geschosse, Med. Klin. **15**: 1063, 1919.

9. Küster, E., and Lewin, Louis: Ein Fall von Bleivergiftung durch eine im Knochen steckende Kugel, Arch. f. klin. Chir. **43**: 221, 1892.

* Bathed with synovial fluids. † Other diseases not specified.

"bullet" I have included rifle and pistol bullets as well as musket balls. Shot—"bird" and "buck"—accounted for a fairly high proportion of the cases, and this is particularly noteworthy when one considers the large number of shrapnel and rifle bullet wounds sustained in the war of 1914-1918. Evidence from in vitro

Fig. 5 (case 2).—Appearance in 1934, shortly after the wound had been sustained.

experiments [10] has indicated that solution of lead from jacketed bullets occurs and may exceed in degree that from uncovered lead, but there is no clinical evidence to bear this out.

The interval between lodgment of the bullet and onset of symptoms diagnosed as due to plumbism was widely variable (from twelve days to forty-eight years). Of the thirteen cases in which the symptoms developed in less than one year, only two would be considered cases of plumbism at the present time. In the one case [11] the onset occurred two months after the wound was received. The bullet was in the head of the tibia, however, was exposed on the articular surface and was found to be greatly worn by action of the knee joint. In the second case,[12] in which intoxication followed three months after shot wounds of the bones of the shoulder and foot were sustained, local dissemination of the shot was noted.

More than half the missiles were in the bones or joints, and in eight of these cases it was specifically stated by the author that the missile was bathed with synovial fluid. In all but two of the ten cases of probable intoxication the bullets were lodged in bones or joints.

Dissemination, which was noted in fifteen cases, was in some instances associated with shattering of the projectile; in others it was due solely to solution and redeposition of the lead.

More than half the patients had some associated disease at times related to the wound. In nine cases suppuration and fistulas were present at the site of the wound and evidences of arthritis were noted when the wounds were near joints (five cases). Other diseases were gas bacillus infection, coronary thrombosis, diabetes, duodenal ulcer in two, neurasthenia, and post-traumatic epilepsy. In instances in which laboratory evidence of significant lead absorption is wanting, it is often impossible to be entirely certain that the symptoms were due to plumbism, particularly when the clinical manifestations on which the diagnosis of plumbism was made were those frequently resulting from the associated disease. For example, in one report [13] the patient was said to have intermittent claudication, arteriosclerosis, chronic nephritis, diabetes and coronary infarction and while under study was operated on for gangrene of the foot. This patient had had a 2.5 Gm. bullet in his brain for forty-eight years. No characteristic symptoms of lead intoxication were present, the diagnosis being based on the presence of lead in the tissues obtained at necropsy. These amounts, particularly in the brain, were somewhat larger than those normally encountered in this country, but their presence without clinical symptoms of plumbism merely indicates that the lead absorption of the patient has been greater than normal.

Vomiting, constipation or colic were present in twenty-seven cases. Three patients had all three symptoms, eight had constipation and colic alone. In seven colic was the only symptom of the digestive tract noted.

Neuromuscular symptoms or symptoms of the central nervous system were frequently present; six patients had antebrachial paralysis, and in one case there was an associated hemiplegia. Delirium and convulsions were present in two cases and were attributed to lead encephalopathy. One of these patients had epilepsy, however, while in the other case the only signs of lead

Fig 6 (case 2).—Appearance seven weeks later than the view shown in figure 5.

intoxication were lead line and digestive symptoms. Stupor or amentia was present in three cases and neurasthenic or psychasthenic symptoms were present in three. In four cases arthralgia, tremor and paresthesia were the only disturbances noted.

The lead line, present in sixteen cases, may be taken as evidence of lead absorption, and the same is true

10. Küttner, Hermann: Fremdkörperschicksal und Fremdkörperbestimmung, in Küttner, Hermann, and Garré, Carl: Bruns Kriegschirurgische Hefte der Beiträge zur klinischen Chirurgie, Tübingen, H. Laupp, 1916, vol. 5, pt. XX, p. 21.

11. Londres, Genival: Intoxication saturnine par une balle de plomb, Presse méd. **42**: 465-468 (March 21) 1934.

12. Mstibovskiy, I. A.: Case of Lead Poisoning After Gunshot Wound, Sovet. khir., 1935, No. 12, pp. 85-88.

13. Rutishauser, E.: Bleigangrän und Encephalopathie, Virchows Arch. f. path. Anat. **297**: 119-140, 1936.

for stippling, present in fifteen cases. Both stippling and anemia were of lower incidence than would be anticipated in cases of frank plumbism such as are seen in industry.

Of particular interest would have been the progress following removal of the bullet, which was done in most cases. Unfortunately, in more than half the cases death occurred or notes on the postoperative course were omitted.

Fig. 7 (case 2).—Appearance in 1939.

COMMENT

Not more than eight or ten of these cases at most will certainly satisfy present day requirements for the diagnosis of lead poisoning. In most instances the symptoms would be attributed to other causes. With the present means for determining the magnitude of lead absorption, uncertainty need no longer exist. If significant amounts of lead are being absorbed from a projectile in the tissues, the fact may be established readily and the likelihood of intoxication estimated.

The question of the advisability of removing bullets wherever possible has been raised by many authors. Bronvin,[1] Lewin[14] and others held that intoxication from bullets occurred with greater frequency than was suspected, while others, as Bonhoff,[15] Hofbauer,[16] Dennig[17] and Neu[18] and clinical surgeons have denied this emphatically. A few, particularly Braatz[19] and Habs,[20] are of the opinion that plumbism from bullets may occur rarely but that this does not constitute an adequate indication for removal of the projectile in all cases. Much of the confusion is due to differences in the interpretation of analytic results and, to a greater extent, to differences in opinion as to what constitutes the clinical entity known as plumbism. For example, Neisser,[21] Lewin, Schlesinger[22] and others considered a positive qualitative test for lead in the urine, blood or spinal fluid as evidence of intoxication, while Hofbauer, Dennig, Neu and Lipp[23] considered such a finding devoid of diagnostic significance in the absence of clinical symptoms of intoxication. The accepted view at present is that, since lead is normally present in small amounts in the body fluids, quantitative data are necessary and results are significant only when normal levels are exceeded.

Opinions on the clinical diagnostic criteria are as diverse as those regarding the laboratory data. One extreme of opinion expressed by Haenisch[6] is that instances of "fatal plumbism can occur in which the known usual signs of the disease are lacking," and Neisser considered the presence of neurasthenic symptoms to be adequate evidence of lead intoxication. On the other hand, after critical examination of cases reported up to 1922 Bonhoff[15] concluded that the symptoms were in the main general and could be attributed to suppuration or other disease; in any event the cases had been too poorly studied to exclude other avenues of lead absorption or the effects of improvement in the diet and regimen in the hospital. Habs[20] studied the thirty-six cases reported up to 1927 and considered six as cases of proved plumbism, the remainder doubtful.

My opinion from a study of the forty cases reported up to this time conforms with that of Habs. I have found eight or ten cases of probable lead intoxication. Of these only three[24] satisfy all the criteria in that quantitative analytic data were obtained on body fluids; in seven other cases[25] the clinical evidence makes the diagnosis seem probable.

CONCLUSIONS

There are forty reported cases of lead poisoning from bullets lodged in the tissues. Only three fulfil all modern criteria and in seven others the diagnosis seems probable. A further thirteen showed signs of lead absorption.

Poisoning from this source is a rarity, but lead absorption can occur from bullets lodged in the tissues, particularly in bones at the joints, as in the two cases reported in this paper. The possibility of delayed intoxication should have some weight in the decision as to the removal of bullets.

Eden Avenue.

14. Lewin, Louis: Amtl. Nachr. d. Reichsversicherungsamts, Dec. 17, 1907. Das toxische Verhalten von metallischem Blei und besonders von Bleigeschossen im tierischen Körper, Arch. f. klin. Chir. **94:** 937, 1911; Die Gefahr der Vergiftung durch ganze oder zersplitterte, im Körper lagernde Geschosse, Med. Klin. **12:** 31-34, 1916; Bleivergiftung durch im Körper lagernde Bleigeschosse, Ztschr. f. arztl. Fortbild. **14:**538-541, 1917; Das Verhalten von Kugeln aus einer Bleinatriumlegierung gegen Wasser, München. med. Wchnschr. **65:** 38, 1918.

15. Bonhoff, E.: Ueber die Giftwirkung der Blei-Steckschüsse, Beitr. z. klin. Chir. **126:** 324-333, 1922.

16. Hofbauer, L.: Folgen der Brustschüsse, Ztschr. f. ärztl. Fortbild. **15:** 453 and 487, 1918.

17. Dennig, Adolf: Ueber das chemische Verhalten der Bleigeschosse im menschlichen Körper, Med. Cor.-Bl. d. württemb. ärztl. Landesver. **85:** 33, 1915.

18. Neu, Josef: Ueber das chemische Verhalten von Bleigeschossen im menschlichen Körper, Med. Cor-Bl. d. württemb. ärztl. Landesver. **85:** 433 and 445, 1915.

19. Braatz, E.: Bleivergiftung durch die Geschosse nach Schussverletzungen, München. med. Wchnschr. **54:** 1081, 1907.

20. Habs, Ueber Bleivergiftung bei Steckgeschoss, Deutsche Ztschr. f. Chir. **200:** 584-605, 1927.

21. Neisser, E.: Ueber Bleischaden nach Steckschuss, München. med. Wchnschr. **64:** 233, 1917.

22. Schlesinger: Ueber den Nachweis des Bleischadens nach Steckschuss, München. med. Wchnschr. **65:** 39,1918.

23. Lipp, H.: Ueber basophile Granulation im Blute von Schrapnellkugelträgern, München. med. Wchnschr. **62:** 97, 1915.

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THE NEWBORN NURSERY FROM THE POINT OF VIEW OF THE PEDIATRICIAN

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I have selected this subject for joint discussion in this obstetric-pediatric symposium because it offers controversial material for our consideration which carries with it responsibilities of interest to the obstetrician, the pediatrician and the man in general practice. A discussion such as this would not be inclusive unless one considers the newborn nursery as found in the large general hospital with both open and closed staffs, the special lying-in hospital, and the local hospitals widely scattered in the smaller cities throughout the various states.

Only a few of our larger cities can support a special maternity hospital and therefore it becomes necessary for the general hospital to establish special departments for obstetric cases which must provide the best care possible for the mothers and their babies. Many of our hospitals were built in the past, when hospital deliveries represented 25 or 30 per cent of a community's total deliveries, and were not equipped to meet the exigencies of the present day, when as many as 85 per cent of deliveries occur in hospitals. In Chicago during 1939, of 48,909 live births 84.8 per cent of all deliveries took place in sixty-nine hospitals; 14.1 per cent in homes were delivered by doctors, and approximately 1 per cent by midwives. In 1939, 4,670 live babies were born in Cook County Hospital.

In many instances the modernizing of delivery rooms has preceded the improvement of the newborn nursery.

In full appreciation of the fact that a high percentage of all deliveries in the United States are conducted by physicians in general practice, responsibility for the lowering of infant mortality and morbidity nevertheless rests to a large extent on the provisions for the safe care of the mother and child which in their wisdom have been adopted through mutual agreement by departments of health and the medical members of hospital staffs more directly interested in obstetrics and the newborn infant.

The reduction of maternal and infant death rates throughout the United States, and we cannot separate consideration of results attained for both the mother and the child, in the past ten years stands out as a striking answer and refutation of the popular uncensored articles appearing in the lay journals. In Illinois, the state with whose activities dealing with maternal and child welfare I am best acquainted, as an example, there has been a reduction in maternal deaths from 5.23 per thousand births in 1930 to 4.55 in 1935 and 2.88 in 1939, and in Chicago from 4.95 per thousand births in 1930 to 3.46 in 1935 and 2.5 in 1939. These figures speak for themselves.

Even more striking has been the lowering of infant mortality in Illinois in the first month and first year of life, from 56 per thousand live births in the first year of life in 1930 to 45.9 in 1935 and 37.88 in 1939, and in Chicago from 53.4 per thousand live births in 1930 to 40.1 in 1935, 33.7 in 1938 and 31.3 in 1939, or a drop of 41.38 per cent in the last ten years. These figures are representative of what is being noted throughout the United States. We are all agreed that they do not represent the ultimate results to be attained, but they speak well nevertheless for the constructive efforts of those who have been most instrumental in making this possible.

As far as the infant is concerned, the least progress has been made in the number of deaths within the first day, the first week and the first month of life. Many of our states and cities are now concentrating more definitely on the care of the newborn infant in its first days, and especially on the care of the prematurely born infant. It is unfortunate that, in the quoting of statistics, more definite stress has not been placed on the different races of our population, with special consideration of the urban and rural facilities available.

The accomplishment of the best attainable results will be dependent on definite vesting of authority for the conduct of the maternity division and the newborn nursery in reliable and deeply interested medical staff members under whose authority and direction the nursing staff functions. For the safeguarding of the best interests of the mother, her child, the hospital and the prestige of the medical profession, a willing and able consulting staff must also be available.

In the institutions with which I have been connected, confusion and the working at cross purposes have largely been dependent on the absence of regular and constructive conferences between the obstetricians responsible for the maternity wards and the pediatricians or the practitioners in whose care one may find the infants.

Among the provisions of exceptional importance to the newborn are (1) the establishment of regulations covering the conduct of the puerperium as related more especially to the care of the mother's breasts, (2) who shall assume the responsibility of establishing and promoting breast feeding in the early days of the puerperium, and (3) the placing of definite responsibility for the general conduct of the nursery.

At a recent meeting of the American Academy of Pediatrics, one of the discussers remarked that in his community the breast-fed infant was a rarity—this in contradistinction to the results achieved in our Cook County Hospital, where approximately 85 per cent of the mothers are discharged with their babies feeding at the breast.

Few who have had experience in the management of infants will deny the importance of breast feeding, but many who acknowledge its importance do little to encourage it. I am certain we all agreed that many more children should be breast fed than are at the present time. There are many possible causes of failure on the part of the mother to meet her infant's needs, but faulty management is undoubtedly the most common.

It has been my experience that the obstetrician often gives excellent general care to the mother during the latter months of her pregnancy but pays little or no attention to her breasts, especially in the matter of preparing the nipples for the trauma of lactation. Many obstetricians believe that excessive antepartum manipulation of the nipple is of only moderate benefit, and I think that we will all agree that in the nipple with congenitally short ducts the result is usually disappointing. I do not overlook the fact that some breasts are not fitted by nature to function adequately, because of insufficient glandular element.

Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Pediatrics at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

The first days are the danger period to successful breast feeding. First, the obstetrician provides for the mother his most solicitous attention; he has practiced his best obstetrics and has presented her with a normal, uninjured infant. His fears, if any, are centered on the possibility of postpartum complications in the mother. Not the least of these is his desire to avoid trauma to the nipples, with their further danger of secondary breast infection.

As the obstetrician is responsible for the relief of the original hyperemia, guarding against cracked or bleeding nipples and their general care, instruction for their care will naturally be assumed by him. If the mother develops mastitis and breast surgery becomes necessary, the responsibility for such a condition is his. Consequently, I believe that the establishment and maintenance of breast nursing in the early days should be assumed primarily by the obstetrician. If the obstetrician is seriously interested in breast feeding, I believe there should be no conflict of opinion.

I wish, however, to emphasize that if the pediatric representatives do not have access to the mother's breasts so that they can judge their ability to respond to the baby's efforts or those of manual expression, the responsibility of the pediatric service to the newborn is not fulfilled.

What then are the pediatrician's responsibilities? I believe that, where he has been made responsible for the nursery care of the newborn, the conduct of the nursery in its entirety should be his responsibility. The supervising nurse of the nursery should be responsible to the pediatrician and should in turn be under the jurisdiction of the chief nurse in the obstetric department, the latter acting as a liaison officer between the obstetrician and the pediatrician. The nurse in charge of the nursery therefore should be pediatric minded and should of course have had obstetric experience.

It is unfortunate that in some of our institutions, notwithstanding the fact that a visiting pediatrician is responsible in name, he does not assume his full duties. I take it for granted that it is understood that I have been talking largely of service cases. It must of course be realized that, as far as private cases are concerned, the dividing of responsibility for the care of the infant is one of mutual consent.

Most of the responsibility for the service must be left in the hands of the obstetric resident or senior intern, if there is no resident. Joint daily rounds should be made in the nursery by the obstetric and pediatric residents. Causes for weight loss are to be sought for in both mother and infant. On the part of the mother delayed secretion, sore or fissured nipples, depressed nipples, congestion of the breasts and actual insufficiency of secretion due to quality of the breasts must all receive consideration. As far as the infant is concerned, all factors which might be causes for poor nursing must be sought for, more especially congenital anomalies, immaturity and birth hemorrhage.

At stated intervals, rounds of the lying-in division and nursery should be made by the obstetricians and pediatricians so that there can be a definite understanding covering the views of both departments concerning the care of the mother's breasts and the technic established in the nursery.

The chief obstetric nurse, the nurse in charge of the newborn nursery and the house staff should be included in these ward rounds. Much misunderstanding can also be avoided in institutions where the man in general practice does his own obstetric work and assumes the responsibility for the care of the infant, through such conferences. It must be remembered that the bulk of deliveries throughout the country are under the care of men in general practice.

FEEDING REGULATIONS

Now let us look back a century and a half and note the fine wisdom of William Cadogan (1711-1797). In "An Essay upon Nursing and Management of Children from Birth to Three Years," published in 1748, he states:

> I am confident from experience that with a Child kept without food of any kind until it was hungry, which it is impossible it should be just after birth, and then applied to the Mother's breasts, it would suck with strength enough, after a few repeated trials, to make the milk flow gradually in due proportion to the Child's unexercised faculty of swallowing and the call of its stomach.
>
> Four times in four-and-twenty hours will be often enough to give it suck; letting it have as much as it will take out of both breasts at each time. The Mother's milk seldom comes until the third day. The Child is born full of blood, its appetites not awake, nor its senses opened; and requires some intermediate time of abstinence and rest to compose and recover from the struggle of the birth and the change of circulation.
>
> Dry-nursing (artificial feeding) I look upon to be the most unnatural and dangerous method of all. To breed a Child in this artificial manner requires more knowledge of Nature and the animal economy than the best Nurse was ever mistress of; the skill of a good Physician would be necessary to manage it rightly.

At the Michael Reese Hospital the following is the routine practice: Normal full-term infants are placed at the breast six hours after delivery, and then for not more than five minutes on either breast, and thereafter at four hour intervals five times during the twenty-four hours. Water without carbohydrate addition is fed to the infant six times in twenty-four hours, in amounts of 1 ounce at first and up to 2 or 3 ounces later. Infants are kept under close observation for evidence of inanition. If at the end of the fourth day the breasts are still not showing evidence of secreting an adequate amount of milk, a milk mixture is started as a complement. Usually both breasts are offered at a nursing. In our experience the average infant leaving the hospital at the tenth day after birth has reached a weight within 100 to 150 Gm. or less of its birth weight.

Since most cracked nipples develop during the first four days, this is the important period for prophylaxis. Factors which should be recognized as helpful aids to breast feeding are:

The application of the breast pump or hand expression for aid in developing the retracted nipple.

The placing of the infant at the breast for not more than five minute periods during the first three or four days, or preferably at both breasts for even shorter periods.

Simple depression of the lower jaw of the infant should be practiced at the conclusion of feeding to prevent trauma as the infant is being removed from the breast.

In the presence of cracked nipples the infant may well be taken off the breast temporarily, and hand expression or breast pump should be used during that time to promote secretion.

At Cook County Hospital, twenty-four hours after birth the infant is fed an ounce or 1½ ounces of breast milk obtained from wetnurses, the objective

being to implant Bacillus bifidus in the intestinal tract. This organism keeps the p_H very low, thereby retarding the growth of the colon group of organisms. The infant is not placed to the breast until after this first feeding of breast milk. With this procedure the early stools of the infant are of the so-called breast-fed type. There have been no severe diarrheas in this newborn nursery in the last three years.

ADVANTAGES OF JOINT OBSTETRIC AND PEDIATRIC ARRANGEMENT

The advantages of a joint obstetric and pediatric arrangement are:

1. The physician in charge of the mother will have evaluated her possibilities for breast feeding and by advice often avoid the anxiety of the mother as to her ability to carry on when at home, when she so often learns for the first time that her crying baby is simply carrying on the same performances that he was accustomed to in the hospital nursery.

2. On discharge from the hospital there will be avoided abrupt changes in routine in the care of the infant, as is so often the case when the pediatrician does not enter the picture until the infant is returned to its home.

Every mother should be taught manual expression while still in the hospital. The nursing division has not performed its obligation to the mother and infant unless the mother has been taught manual expression, if for no other purpose than that breast bottle feeding can be provided in case of emergency. The electric pump has a large and successful place in the hospital nursery; however, it carries the danger that hand expression may not be taught the individual mother. The infant is, of course, by all odds the best breast pump.

PREPARATION FOR DISCHARGE

By the tenth or twelfth day the average mother is discharged from the hospital and assumes the responsibility for the care of her infant in the home. With what preparation does the average mother in moderate circumstances who cannot afford a trained nurse or nurse maid assume her home care of the infant?

The individual instruction in some well organized hospitals is good; in most of them it is indifferent. She may be given some printed directions or a board of health God's blessing and the good wishes of the obstetric department. When, in at the most four hours from the time she has left the institution, the infant starts the well rehearsed performance which he has so well practiced and which has achieved the desired results but with which the mother was so little acquainted, there starts the chain of circumstances which I am sure I do not have to recount for your information, for they are only too well known to you, your own household and the telephone company, the results being a decrease in or even a drying up of the breast milk supply.

CONCLUSION

I would urge that staff conferences open to all local physicians should be held at stated times in all hospitals. At such meetings all phases of maternity and newborn care should be discussed, and their value becomes increasingly productive when individual records and cases are discussed.

It has been the experience of those interested in furnishing so-called refresher courses in obstetrics and pediatrics that the progressive physicians are in regular attendance, while those who might profit most are conspicuous by their absence. Sooner or later all must avail themselves of hospital service for their patients, and it is in the community hospital that they can best be contacted.

In every city or town "Every hospital should be a teaching center."

104 South Michigan Avenue.

Clinical Notes, Suggestions and New Instruments

NERVE ROOT INFILTRATION IN MYELOGENOUS LEUKEMIA

J. P. Murphy, M.D., and B. S. Brody, M.D.
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Involvement of the central nervous system in the course of acute or chronic myelogenous leukemia is not unknown. As emphasized by Critchley and Greenfield[1] in their discussion of cord symptoms in leukemia and chloroma, the pathologic manifestations in such cases may be of several kinds. Localized collections or "tumor formations" of the abnormal white blood cells in the meninges are most common, according to these authors. The cases reported in their article of four males aged 19 years or younger were featured by the presence of such leukemic or chloromic masses in the epidural or subarachnoid spaces. In addition, however, a special finding in three of the cases was invasion of the spinal and cranial nerve roots by the myeloid elements, which in these cases apparently accounted, at least in part, for the radicular pains and other disturbances (including peripheral facial and palatal palsies, as well as unilateral deafness) from which the patients suffered. Root infiltration was also prominent in the report of Cornil and his associates,[2] but in that instance there were also an epidural tumor, hemorrhages and leukemic invasions in the parenchyma.

In the case which forms the subject of the presentation which follows, it is felt that the symptoms and physical manifestations are most readily explicable on the single basis of injury to cranial and spinal nerves secondary to the entrance of myeloblasts and myelocytes into the nerve roots.

Examples in the literature of other cerebrospinal complications referable to the blood dyscrasias, such as myelomalacia subsequent to thrombosis or compression or widespread extensions of the abnormal cells into gray and white matter,[3] will not be referred to in detail, since they are not pertinent to the present discussion.

CLINICAL HISTORY

P. M., a white man aged 39, a janitor, admitted to the Grace Hospital, Jan. 22, 1940, complained of inability to walk for the previous two and one-half weeks.

The onset of the present illness apparently occurred about four or five months before hospitalization. At that time vision in the left eye became blurred; the extraction of several teeth did not improve this difficulty. One month later the sight in the right eye began to fail and the patient rapidly became blind on that side, visual acuity in the left eye recovering meanwhile. He also noted that the right side of his face was somewhat asymmetrical. During an admission to another hospital both tonsils were removed, and severe bleeding persisted from the tonsillar beds postoperatively. The patient then realized that his legs were becoming weak; he felt tired and listless and noticed loss of weight.

Dr. C. J. Bartlett gave the authors permission to use the gross autopsy report.

From the Grace Hospital and Department of Pathology, Yale University School of Medicine.

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For the two and one-half weeks before coming to the Grace Hospital, loss of strength in the lower extremities had been so extreme that he had been confined to bed. The right arm by this time was not as strong as formerly, there was partial deafness in both ears and the right facial weakness had become more marked.

The past and family histories were noncontributory.

On admission the temperature was 103 F. (rectal), the pulse 110 beats per minute, the respiratory rate 30 per minute and the blood pressure, 146 mm. of mercury systolic and 100 diastolic. The patient was well developed and appeared well nourished but chronically ill. Both ear drums were gray. The heart was not enlarged, there were no cardiac murmurs and the lungs were not unusual on percussion and auscultation. The edge of the liver was palpable two or three fingerbreadths below the right costal margin. A few slightly enlarged lymph nodes could be felt in each inguinal region. There was marked tenderness to percussion in the right costovertebral angle.

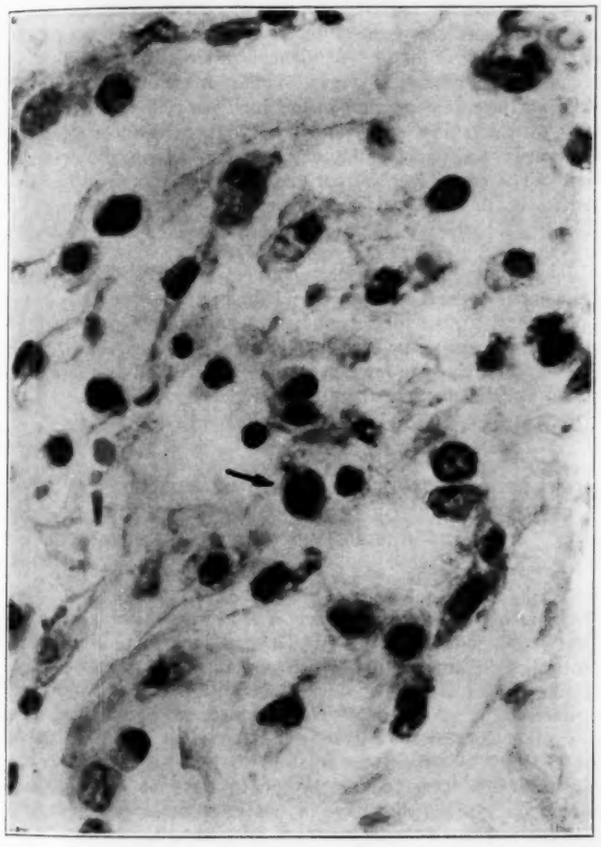

Fig. 1.—Myeloblasts and myelocytes in the cerebral meninges. Arrow indicates young myeloid cell with hyperchromatic nucleus. Giemsa stain; × 250.

The patient was well oriented and the sensorium seemed to be intact. The sense of smell was present bilaterally. He was completely blind in the right eye, the fundus of which was obscured by haziness of the media. The nasal margin of the left optic disk was blurred and the retinal vessels were sclerosed. The right pupil was fixed to light, while the left responded sluggishly. There was no apparent defect in the left visual field. Slight nystagmus was present on right lateral gaze. The corneal reflex on the right was absent but that on the left was not. There was obvious right facial paralysis of the peripheral type. The right ear was completely deaf, and hearing in the left was impaired. The gag reflex was absent.

Both arms were weak, but not more so than could be accounted for on the basis of the patient's general condition. Biceps and triceps reflexes were in order. The abdominal cutaneous reflexes were absent on the right and sluggish on the left. Cremasteric responses could not be obtained on either side. There was a flaccid paraplegia of the lower extremities, and tendon jerks could not be elicited in the legs. The Babinski sign was absent bilaterally.

Vibratory sensation was impaired in each lower limb.

During the next two days the stools were noted to be tar colored, and tests revealed that they contained blood. Abdominal distention had appeared as well. A lumbar puncture, performed on the third hospital day, disclosed an initial pressure of 260 mm. of water, which fell to 160 mm. when 10 cc. of slightly

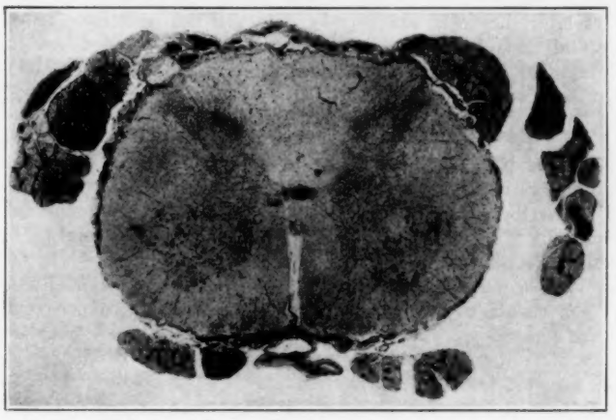

Fig. 2.—Section through lumbar spinal cord. Note heavy infiltration of roots of cauda equina. Nissl stain; reduced from a photomicrograph with a magnification of 10 diameters.

turbid fluid was removed. Examination of the specimen revealed the presence of 1,015 large mononuclear cells, 5 erythrocytes and 5 polymorphonuclear leukocytes in a cubic millimeter of the fluid. The results of a blood count on admission were (per cubic millimeter) red blood cells 4,100,000, hemoglobin 65 per cent (Tallqvist), white blood cells 12,000, differential count: polymorphonuclear leukocytes (segmented forms) 52 per cent, nonsegmented neutrophils 6 per cent, large lymphocytes 18 per cent, small lymphocytes 21 per cent, monocytes 0, eosinophils 3 per cent and basophils 0.

The spleen became palpable on the fourth hospital day and the liver seemed enlarged, as compared with the previous examination. Ascites was also detected. A papulopustular rash on the upper arms and trunk appeared the next day (fifth), the eyelids had become edematous and the right conjunctival sac was injected. The initial spinal fluid pressure on that day was 220 mm. of water; a web formed immediately on the surface of the fluid withdrawn and microscopic study of the specimen

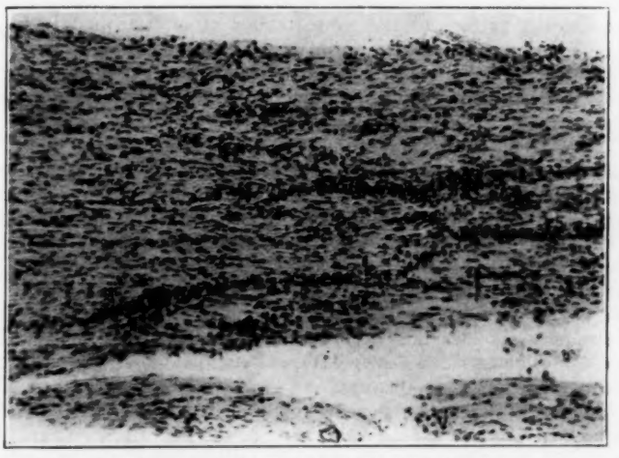

Fig. 3.—Longitudinal section of the left acoustic nerve. Leukemic cells clumped between and among adjacent myelinated axis cylinders. Nissl stain; reduced from a photomicrograph with a magnification of 125 diameters.

revealed numerous small lymphocytes, many large mononuclears and several multinucleated giant cells.

The opinion of one of us (B. S. B.) at this time was that the patient was suffering either from a chronic infectious process of the central nervous system (such as tuberculosis or torulosis) or from myelogenous leukemia with cerebrospinal involvement.

A third spinal fluid examination was then made (sixth hospital day). The pressure was still elevated (230 mm. of water), and 2,560 large mononuclear cells, 3 small mononuclears and 70 erythrocytes as well as a few multinucleated giant cells were found in a cubic millimeter of the turbid fluid.

One week after admission an icteric tint to the skin and scleras was noted. The patient was incontinent of urine. Three days later the neck was slightly stiff, and the next day (tenth hospital day) he died. The temperature, which had fallen to around 101 F. shortly after admission, rose to 103 F. (rectal) just before death.

SUMMARY OF LABORATORY OBSERVATIONS

The red blood cell count ranged around 4 million per cubic millimeter with the hemoglobin content near 65 per cent (Tallqvist) during most of the patient's stay. The number of white blood cells varied from 12,000 to 14,000 per cubic millimeter. Numerous differential counts revealed from 40 to 60 per cent segmented polymorphonuclear leukocytes, from 10 to 20 per cent unsegmented neutrophils, from 9 to 18 per cent "large lymphocytes" and from 15 to 20 per cent "small lymphocytes." A few normoblasts were seen in smears of the blood taken in the last three days.

A positive test for albumin (1 plus) was recorded in all urinalysis reports. Rare white and red blood cells were seen in the urinary sediment on all occasions, with an occasional cast being discovered shortly before death. Specimens taken on the third and ninth hospital days were positive for bile.

The blood and spinal fluid Wassermann and Kahn reactions were negative.

NECROPSY

Postmortem examination was performed four hours after death. Petechial hemorrhages were noted in the skin of the body around the umbilicus. Six hundred cc. of clear yellow fluid was present in the abdomen. The liver edge extended 6 cm. below the right costal margin. Two hundred cc. of light yellow transudate was found in the right pleural space and 125 cc. of the same kind of fluid in the left pleural space. The lower lobes of both lungs were congested and edematous. The liver (2,890 Gm.) and the spleen (860 Gm.) were enlarged, and mottled areas were visible beneath the capsule and on the cut surface of the latter. The kidneys were pale. Several retroperitoneal lymph nodes were firm and large. Grayish red marrow filled the trabeculae of the ribs.

The cerebral meninges were thin and fairly translucent. A cerebellar pressure cone of moderate size was present around the medulla. What appeared to be petechiae were numerous on the cut surface of the white matter of both frontal lobes. The spinal meninges were slightly thickened and opaque, having a milky color. The parenchymal vasculature was unusually prominent. There were no other grossly visible changes in the cord.

Microscopically, large bizarre cellular elements were found in the leptomeningeal meshes and in the Virchow-Robin spaces surrounding the vessels of the gray and white matter in the brain and cord (fig. 1). In Nissl, hematoxylin-eosin and Giemsa preparations (particularly well demonstrated in the last) the nuclei of these cells were found to be big, vesicular and light or dark blue, and not infrequently in mitosis. The cytosomes were scant and faintly tinted (light pink); granules were seen in some cytosomes but were absent in most. These elements were myeloblasts and "early" (types A and B) myelocytes, the youngest cells predominating.

Most striking in the sections of the spinal cord and medulla examined was the extensive invasion of the nerve roots (figs. 2 and 3). Not only had the myeloid cells entered the fasciculi of the cranial and spinal nerves but there was also an accompanying Schwann cell proliferation, indicating a reparative process consequent on demyelination. Microglia and astrocytes were increased in number in the posterior horns of the cord, and exquisite "axonal" cell change (swelling of neuron, "ground glass" appearance of cytoplasm and nuclear excentration) featured the motor cells of the anterior horns. The ganglion cells of Clark's columns were reduced in number.

In a very few places the malignant cells had penetrated the molecular layer of the cerebral cortex and the most superficial part of the cord, but not to considerable distances. "Marginal gliosis" had taken place in the gray matter immediately underlying the meninges, where the usually sparse meningeal infiltration was heavy. This too was only minor in degree.

"Chronic" cell change characterized a few neurons of the vestibular nuclei of one eighth cranial nerve.

The same myeloblasts were found in the sinuses of the lymph nodes and, as leukemic infiltrations, invaded the spleen, the liver, the adrenal, the pancreas and the pulmonary alveoli. Many such cells, with big nuclei sometimes containing nucleoli and occasionally with a few granules in their cytoplasm, practically constituted the myeloid portion of the marrow, the amount of erythropoietic tissue of which was in abeyance.

COMMENT

In the absence of extensive intramedullary cellular invasion, hemorrhages or infarcts, or compression of the cord by meningeal tumor formation, it is believed that the paraplegia which was so striking in the clinical picture of this patient resulted because of damage to the anterior and posterior roots of the spinal nerves. This is confirmed microscopically by the "axonal" type of cell change (similar to what is seen with section of the motor nerves) in the ganglion cells of the anterior horns of the spinal cord and by the presence of astrocytic proliferation and paucity of Clark's column cells in the posterior horns. The same mechanism undoubtedly accounted for dysfunction of the cerebral nerves.

SUMMARY

Clinically the most prominent features of acute (myeloblastic) myelogenous leukemia occurring in a man aged 39 were evidence of peripheral injury to cranial nerves and flaccid paraplegia of the lower extremities. Invasion of nerve roots by the leukemic cells was of principal interest pathologically and is thought to account for the bizarre manifestations seen during life.

310 Cedar Street.

IMPROVED METHOD OF STAINING WITHIN TISSUES, LEPTOTRICHES OF PARINAUD'S CONJUNCTIVITIS AND GRAM-POSITIVE MICRO-ORGANISMS

F. H. VERHOEFF, M.D., BOSTON

Judging by my own experience, it is always possible by means of the staining method [1] described by me in 1913 to demonstrate leptotriches in any section which contains one or more of the characteristic foci of leptotrichosis conjunctivae [2] (Parinaud's conjunctivitis). Assuming that this disease is as frequent in many other localities as it is in Boston (two or three cases a year), failure by other investigators to find these micro-organisms has often been due to the employment of faulty technic. Judging by sections that have been sent to me, a common error is failure to exercise sufficient care in making the biopsy. Only a small bit of tissue need be excised, but since the leptotriches can be readily found only in the foci of macrophages it is essential to include at least one of the gray areas, preferably the largest, that can be seen just beneath the surface of the lesion.

Since the leptotriches of leptotrichosis conjunctivae as they occur in the tissues are completely decolorized by the ordinary Gram or Gram-Weigert method, strictly speaking they may be said to be gram negative. Yet in a sense they are gram positive, since after they are stained in methyl rosaniline the use of compound solution of iodine is necessary to prevent their decolorization by the procedure I have employed. The essential difference between this procedure and the Gram method lies in the successive employment of different solvents for brief periods of time. If alcohol alone, as in the ordinary Gram method, or aniline alone, as in the Gram-Weigert method, is used as the solvent, by the time the tissues are sufficiently decolorized the leptotriches are completely decolorized. In my method, before

From the Howe Laboratory of Ophthalmology, Harvard Medical School, and the Massachusetts Eye and Ear Infirmary.

1. Verhoeff, F. H.: Parinaud's Conjunctivitis: A Mycotic Disease Due to a Hitherto Undescribed Filamentous Organism, Arch. Ophth. **42**: 345, 1913.

2. Verhoeff, F. H.: Observations on Parinaud's Conjunctivitis, Leptotrichosis Conjunctivae, Am. J. Ophth. **1**: 705 (Oct.) 1918.

the micro-organisms become decolorized to an important extent by alcohol the sections are transferred to a different kind of solvent. This washes away the alcohol and further decolorizes the tissues, but before it can permeate and decolorize the leptotriches the sections are transferred to oil, which checks the decolorization. Further differentiation is similarly obtained by transferring the sections alternately to oil and alcohol. Success of this method apparently means that to the solvents the leptotriches are less permeable than the surrounding tissues.

In my original method chloroform was employed as one of the solvents. Recently Mr. Thomas Blake, technician in the Howe Laboratory, on his own initiative has tried other solvents as substitutes for chloroform, namely orthochloroaniline, tetrachloroethylene, methyl aniline, carbon tetrachloride and trichloroethylene. We have found that of these, trichloroethylene provides certain advantages over chloroform. The chief advantages are that it lessens the danger of overdecolorization and causes few if any precipitates in the sections. When precipitates occur, they may be removed by the subsequent treatment without danger of decolorization of the leptotriches. Another advantage is that it renders the method as satisfactory after fixation with Zenker's solution as after fixation with solution of formaldehyde. By the chloroform method, we had found it extremely difficult after fixation with solution of formaldehyde to avoid complete decolorization of the leptotriches. We have found that in the new method the time of staining with methyl rosaniline can be reduced to two minutes. The chief disadvantage of the trichloroethylene is that it is apt to leave the tissue cells and infiltrating cells deeply stained, so that the masses of leptotriches may not be so easily recognized under low magnification as when chloroform is used. This, however, is offset by the fact that the leptotriches are more deeply stained. Another disadvantage is that trichloroethylene is decomposed by exposure to light and when not in use must therefore be kept in the dark.

The details of the modified Gram stain as now employed in this laboratory are as follows:

Fix fresh tissue in Zenker's solution or solution of formaldehyde.

Embed in celloidin or paraffin. Celloidin sections are the more readily manipulated.

Cut sections as thin as possible, not more than 10 microns in thickness.

Stain sections in hematoxylin and eosin.

Mount, examine and select sections that contain the largest foci of macrophages.

By the aid of xylene remove the selected sections from the slide and wash in oil of thyme, then in 95 per cent alcohol and then in water. (Hematoxylin may be removed by acid alcohol, but this is not necessary.) If large foci of macrophages have been found, adjacent unstained sections will undoubtedly also contain them and may therefore be used instead.

The solvents now to be used are placed in small receptacles such as ordinary salt cellars. Celloidin sections are to be immersed in these. In the case of paraffin sections the solutions are to be dropped on the slides by means of eye droppers. Water is placed in large finger bowls.

Place the celloidin section from the water on a slide. Wipe away any excess of water and drop on the section Stirling's crystal violet (methyl rosaniline 5 Gm., 95 per cent ethyl alcohol 10 cc., aniline 2 cc., water 88 cc.). After two minutes,

Float the section from the slide into a bowl of water. Wash in several changes of water; this requires about two minutes.

Immerse in compound solution of iodine, from twenty to sixty seconds (iodine 1 Gm., potassium iodide 2 Gm., water 100 cc.).

Wash in water and transfer to

95 per cent alcohol. Stir the section around until the stain begins to come out freely, about five seconds, and then transfer quickly to

Trichloroethylene.[3] Stir the section around until the color ceases to come out freely, about ten seconds; transfer to

Oil of thyme one minute, then to

95 per cent alcohol five seconds and again to

Oil of thyme. Examine on the slide under the low power of the microscope. If precipitates are present, or differentiation is insufficient, differentiate further by alternate immersions in 95 per cent alcohol and oil of thyme, five seconds each.

Wash in xylene, two changes and

Mount in cedar oil on a slide.

By this method the leptotriches should be deeply stained and easily recognizable when occurring, as is usually the case, in masses. Isolated leptotriches will probably not be recognized by inexperienced observers. If no leptotriches are visible, other structures such as fibrin, granules of mast cells and chromatin may possibly be mistaken for them by those who have never seen these micro-organisms. When leptotriches are present in masses, however, their appearance is so characteristic and so different from any other structures in the tissues that they are easily identified.

For the staining of gram-positive micro-organisms and fibrin within tissues, I have found this method (and also the chloroform method) superior to the ordinary Gram or Gram-Weigert method. In the case of gram-positive bacteria, if desired, the differentiation can be carried further in each of the solvents until the fibrin is decolorized. In the only case of sporotrichosis in which I have applied this method to sections I succeeded in staining the sporotriches. By this method I have been able to stain meningococci within sections in spite of the fact that these cocci are gram negative. Possibly the method may be found useful for the demonstrating of still other gram-negative micro-organisms within tissues.

243 Charles Street.

3. Obtainable from the Eastman Kodak Company.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

EUCATROPINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1940, p. 113).

Eucatropine Hydrochloride-Werner.—A brand of eucatropine hydrochloride-N. N. R.

Manufactured by the Werner Drug & Chemical Co., Cincinnati, Ohio. No U. S. patent or trademark.

PROCAINE HYDROCHLORIDE-UPJOHN (See New and Nonofficial Remedies, 1940, p. 83).

The following dosage forms have been accepted:

Hypodermic Tablets Procaine Hydrochloride 0.05 Gm. (¾ grain). Each tablet contains procaine hydrochloride 0.05 Gm. (¾ grain) with sodium chloride as a base. One tablet dissolved in 1 cc. of distilled water makes a 5 per cent solution of procaine hydrochloride.

Hypodermic Tablets Procaine Hydrochloride 0.02 Gm. (⅓ grain) with Epinephrine 0.025 mg. (1/2,500 grain): Each tablet contains procaine hydrochloride 0.02 Gm. (⅓ grain), epinephrine 0.025 mg. (1/2,500 grain), sodium chloride 0.013 Gm., benzoic acid 0.3 mg., sodium bisulfite 0.125 mg. and boric acid 2.27 mg. One tablet dissolved in 1 cc. of distilled water makes a 2 per cent solution of procaine hydrochloride.

SODIUM CACODYLATE (See New and Nonofficial Remedies, 1940, p. 109).

The following further dosage forms have been accepted:

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol 0.05 Gm. (¾ grain), 30 cc. vial: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol 0.2 Gm. (3 grains), 30 cc. vial: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol 0.3 Gm. (5 grains), 30 cc. vial: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol 0.5 Gm. (7¼ grains), 30 cc. vial: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol 0.065 Gm. (1 grain), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

THIAMIN CHLORIDE (See New and Nonofficial Remedies, 1940, p. 528).

The following dosage forms have been accepted:

Tablets Thiamine Hydrochloride, 5 mg.
Prepared by Frederick Stearns & Co., Detroit, Mich.

Tablets Thiamine Hydrochloride, 10 mg.
Prepared by Frederick Stearns & Co., Detroit, Mich.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 2, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PHYSICAL STANDARDS UNDER SELECTIVE SERVICE

In the section of THE JOURNAL devoted to medical-military preparedness in this issue appears an abstract of the standards which have been adopted to guide the physicians who will be associated with local selective service boards and medical advisory boards and also the specialists who will be associated with the induction boards. The manual is essentially the same for all of these groups. Every physician will find it informative to study carefully these standards, bearing in mind that the purpose is to select men capable of undergoing military training and not essentially an inventory throughout the nation of the health of men from 21 to 35 years of age.

In the selective service of 1917 each of the young men who appeared before a local board was given a physical examination. Under the present system only those men will be physically examined who have been found suitable for training after exemption has been considered from the point of view of marriage, essential occupation or some of the many other reasons which have been considered sufficient to exempt the young man from military service. The selective service organization has prepared six pamphlets in which the various aspects of the work of the selective service boards are discussed. Especially noteworthy is the excellent section on malingering in the pamphlet on physical standards, which will find application not only in the work of the selective service boards but no doubt in the practice of every physician who examines any number of persons for insurance, for industry, or for educational or other purposes.

As has been previously mentioned, a final examination, which is the one made by the induction board, will be necessary before any young man is sent for training to a camp or cantonment. That examination will be made by a group of specialists who will be given the necessary facilities and time for a study much more comprehensive than can be made by either the examiner for the local selective service board or the medical advisory board.

Especially noteworthy also are the new regulations regarding serologic examination, not duplicated, as far as we know, in any other country or by this country in any previous emergency. Special interest taken by the United States Public Health Service in this phase of health or disease is reflected in this procedure. Every young man who receives a physical examination by a physician associated with the selective service board will have a serologic test. If the test is positive, it is to be repeated. Apparently those who have syphilis with remedial manifestations—except those with cerebrospinal, cardiovascular or visceral syphilis—will be placed in class 1A, which is the group considered to be qualified for general military service. Presumably the decision as to how much attention is to be given to the presence of syphilis will rest with the military authorities after induction into the service.

EXPERIMENTAL HYPERTENSION

The probability of developing therapeutic measures to cure or ameliorate a clinical condition is greatly enhanced when it is possible to produce a similar situation experimentally in animals. Such studies have been of inestimable practical value and it is not surprising therefore, in view of the importance of the condition, that much investigative effort has been expended in an effort to produce experimentally in animals an elevation of the blood pressure which might be comparable to clinical hypertension. Much information has been accumulated as a result of research in this field; in this connection a recent review by Blalock [1] is timely and merits consideration.

1. Blalock, Alfred: Physiol. Rev. **20**: 159 (April) 1940.

In general, research activity into the cause of hypertension has followed along two lines, one involving a study of hypertension effected by procedures carried out on the central nervous system, the other dealing with experimental hypertension of renal origin. With regard to the hypertension that is generally considered to be of nonrenal origin, it seems certain that section of the moderator nerves results in an elevation of the blood pressure, usually of temporary nature, although it may sometimes be sustained. Whether or not there is any relationship between this type of hypertension and the clinical manifestation in man is, of course, problematic. Although it is true that increased vasoconstriction is present in both essential hypertension and experimental hypertension due to removal of the moderator nerves, it does not necessarily follow that essential hypertension is due to a derangement of the carotid sinus and aortic depressor nerve mechanisms. Indeed, it has been pointed out by Nowak and Walker [2] that the similarity lies in the end result rather than in the cause. The elevation of blood pressure effected by increased intracranial pressure has also been studied. However, a review of the pertinent literature [1] evokes the impression that this type of hypertension cannot be produced with great regularity and is usually not lasting. Cerebral anemia produced by progressive occlusion of the various cerebral arteries also results in an elevation of the blood pressure.[2] Nevertheless it is doubtful whether this method is of practical value as a consistent means of producing chronic hypertension.

At the present time interest is centered particularly on experimental hypertension of renal origin. The problem has been approached experimentally from many different angles. Thus, some investigators have studied the production of a condition resembling glomerulonephritis in animals, many have investigated the effect on blood pressure of damage to the kidneys or of nephrectomy, including subtotal nephrectomy by various methods, and other investigators have carried out research on the effect of occlusion of the ureters or of constriction of the renal arteries. Hypertension resulting from constriction of the renal arteries is of particular interest, and fundamental work in this connection has been carried out by Goldblatt [3] and his associates. Depending on the degree of constriction of the renal arteries, hypertension either with or without a disturbance of renal function may be produced. The observation that bilateral renal ischemia may result in a persistent elevation of the blood pressure has made possible the regular experimental production in animals of a condition analogous to one encountered in cases in man. Within the past few years the mechanism which is responsible for the production of hypertension by renal ischemia has been intensively investigated. Evidence has been accumulated which indicates strongly that it is not a nervous mechanism. Similarly, it would seem that although the endocrine glands are important in determining the degree of response they are not essential for the development of renal hypertension, associated with renal ischemia. The possibility that a chemical mechanism is involved in this increase in blood pressure is at present receiving considerable attention. Experimental evidence is available which supports the view that the hypertension associated with renal ischemia is the result of the action of a pressor substance which is formed in the kidney and enters the blood stream. Moreover, experiments indicating the exclusion of other possible mechanisms also argue indirectly in favor of a humoral factor. It is interesting to note that renin, a renal pressor substance (which is now believed to require the presence of an activator to be effective), was first described more than four decades ago.

Although it is, of course, to be granted that some types of hypertension are of nonrenal origin, most instances of experimental and probably of clinical hypertension, according to Blalock, would seem to be related to some abnormality in the function of the kidneys. In this connection it is interesting to refer to Karsner's [4] recent statement that failure to demonstrate any signs of renal incompetence in life is not indicative of the absence of arteriolar disease of the kidneys. In any case investigations on experimental hypertension have afforded much valuable information and will certainly continue to do so.

2. Nowak, S. J. G., and Walker, I. J.: New England J. Med. **220**: 269 (Feb. 16) 1939.
3. Goldblatt, Harry: Ann. Int. Med. **11**:69 (July) 1937.

Current Comment

IS THERE A SHORTAGE OF INTERNS?

Not infrequently one hears that hospitals cannot secure acceptable interns because there are not enough to go around and that the number of graduates from approved medical schools is insufficient to supply the needs of the hospitals which offer to train interns. Granted that there can never be an exact correspondence between the supply and the demand for interns, it seems worth while to consider whether the available medical graduates are now distributed in accordance with the legitimate needs of the institutions they serve. In many of the best teaching hospitals the house staff bears a ratio to the annual admissions of 1:400 or 1:450. In private institutions the ratio may be as high as 1:600 or 1:800. In the New York Metropolitan area there are at least forty-five hospitals with a house staff in excess of 1:400, ten of them in excess of 1:200. Why do these hospitals employ so many more interns and residents than other institutions which maintain unimpeachable educational standards? Apparently all the hospitals which operate with an excessively large house staff also maintain an ambulance service, and a substantial part of the intern's time is devoted to ambulance duty. For example, in one of the city hospitals each intern is required to spend four months out of twelve "riding the ambulance." In a private hospital the junior interns spend half their time in the ambulance service.

4. Karsner, H. T.: Internat. Clin. **2**: 1 (June) 1938.

If ambulance calls were in reality medical emergencies this experience might be of value to the intern; most of the calls, however, are for transfers or other services which contribute nothing to the education of the physician. These functions could as well be performed by nurses or orderlies; certainly such experience is out of place in an accredited program for the training of interns. Elimination of this undesirable feature of the intern's education (?) in New York City would release a substantial number of interns for service elsewhere.

DYSENTERY AND ESCHERICHIA COLI DEFICIENCY

According to Razi Maner,[1] staff physician of the Turkish army, the colon bacillus is an essential part of the normal defense against enteric infections. From this he concludes that typhoid, paratyphoid and dysentery infections are essentially due to a qualitative deficiency in normal intestinal flora. The present clinical interest in bacterial antagonism dates from Nissle's[2] study of the "antagonistic index" between Escherichia coli and Eberthella typhi. He found that many strains of the colon bacillus are able to kill or completely inhibit the growth of typhoid bacilli when the two antagonistic species are inoculated together in the same culture medium. The ratio of growth of the antagonistic microorganisms was designated by him as the "antagonistic index." With many strains of Escherichia coli the index was 100:0, no viable typhoid bacilli being demonstrable in the resulting mixed culture. Weaker strains of the colon bacillus gave indexes varying from 100:10 to 100:103 or even as low as 100:4,050. He found that the index is a stable characteristic of different colon strains, being retained without appreciable change during many months of artificial cultivation. Gundel,[3] Kamada,[4] Rizzi[5] and others afterward extended this study to the paratyphoid bacillus, staphylococcus, streptococcus and anthrax bacillus. They found that the colon bacillus is antagonistic to each of these pathogenic forms. Maner's current contribution is a statistical survey of dysentery antagonism. Fifty-four colon strains and three dysentery species were titrated for their antagonistic indexes. In his hands the antagonistic index is considerably stronger against dysentery bacilli than that against organisms previously studied. The Turkish clinician found that Escherichia coli isolated from dysentery stools is invariably deficient in antagonistic characters, in all cases the symptoms being associated with a qualitative Escherichia coli deficiency. He emphasizes the fact, however, that much more extensive statistical evidence must be collected before qualitative Escherichia coli deficiency can be accepted as the essential etiologic factor in bacillary dysentery. The possibility of preventing or treating enteric disease by implantation of highly antagonistic strains of Escherichia coli is now under investigation in European clinics.

1. Maner, Razi: Ztschr. f. Hyg. u. Infektionskr. **122**: 17 (Dec.) 1939.
2. Nissle: Deutsche med. Wchnschr. **42**: 1181 (Sept. 28) 1916.
3. Gundel, M.: Zentralbl. f. Bakt., part 1, **104**: 463 (Nov. 22) 1927. Gundel, M., and Kliewe, H., ibid. **124**: 519 (June 10) 1932.
4. Kamada, Keiho: Zentralbl. f. Bakt., part 1, **118**: 304 (Oct. 20) 1930.
5. Rizzi, Italo: Ztschr. f. Immunitätsforsch. u. exper. Therap. **82**: 380 (June 15) 1934.

CAPTAIN ENGLAND—YELLOW FEVER VOLUNTEER—RETIRES

Some forty years has passed since the United States Army Yellow Fever Commission conducted its famous experiments in Cuba. Previously epidemics of yellow fever had prevailed in the United States and had taken many thousands of lives. When Major Reed and his associates began the experiments in Cuba, yellow fever still was a serious threat to American soldiers. Reed called for volunteers to submit to experiments designed to discover the method of transmission of yellow fever. Fourteen volunteers were bitten by mosquitoes which had fed on patients sick with yellow fever, and all became ill. Six volunteers were infected by the injection of blood from patients ill of yellow fever and all became ill. Two volunteers were given injections of filtered blood serum from yellow fever patients and both became ill. Seven volunteers exposed themselves to fomites but not one became ill. In the last group was Thomas M. England, then a private in the Army Medical Department on duty in the typhoid ward. Now Captain England of the Medical Administrative Corps of the Army, he retired October 31 after forty years of active service. Captain England was born in Chillicothe, Ohio. His service is distinguished not only by participation in the experiments that enabled this country to become free from yellow fever; he remained in Cuba two years longer and then served in the Philippine campaign, for which he was cited for bravery under fire. He also served on the Mexican border in 1916 and went to France in 1918 with the Thirty-Third Division and there was promoted to Captain. He has served since then in the Office of the Surgeon General, at San Francisco, at the Fifth Corps Area headquarters in Columbus, Ohio, and at the corps area headquarters in New York. Captain England now will make his home in Columbus.

RIBOFLAVIN IN THE TUBERCLE BACILLUS

Two years ago, Boissevain and his colleagues[1] of Colorado Springs studied the melting point and absorption spectrum of the fluorescent yellow pigment formed by the tubercle bacillus. Their data suggestd a close similarity of this pigment with vitamin B_2 (riboflavin). Street and Reeves[2] of Yale University School of Medicine have recently supplemented this evidence by a study of the growth response of riboflavin-deficient rats to this pigment. Young albino rats were reared to a stunted growth on a riboflavin-deficient diet and were then given the same diet plus a daily dose of 40 micrograms (0.04 mg.) of the tubercle flavin. Within the limits of the experimental error the growth response to this pigment was identical with the growth response of control rats in which the deficiency diet had been supplemented by a daily addition of 40 micrograms of crystalline riboflavin. The evidence seems complete, therefore, that the yellow fluorescent pigment formed by the tubercle bacillus is identical with riboflavin. From 13 to 19 mg. of this bacterial riboflavin can be isolated from 1 Kg. of dry tubercle bacilli.

1. Boissevain, C. H.; Drea, W. F., and Schultz, H. W.: Proc. Soc. Exper. Biol. & Med. **39**: 481 (Dec.) 1938.
2. Street, H. R., and Reeves, R. E.: Proc. Soc. Exper. Biol. & Med. **44**: 641 (June) 1940.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

COORDINATING COMMITTEE APPOINTS SUBCOMMITTEES

Subcommittees on medical education, hospitals, industrial medicine, dentistry, nursing and Negro health have been announced by the Health and Medical Committee of the Council of National Defense. The general committee, headed by Dr. Irvin Abell of Louisville, Ky., former President of the American Medical Association, was appointed by President Roosevelt on September 19 to survey and coordinate the medical resources of the country in the interests of national defense.

Announcement of the subcommittees was made by Dr. Abell from his office at the Public Health Service Administration Building in Washington. Dr. C. Sidney Burwell, dean, Harvard Medical School, Boston, was named chairman of the subcommittee on medical education. Other members of this group are Dr. L. R. Chandler, Stanford University Hospital, San Francisco; Dr. Harold S. Diehl, dean of the University of Minnesota Medical School; Dr. Willard C. Rappleye, commissioner of hospitals of the city of New York, and Dr. John H. Musser of the Tulane University of Louisiana School of Medicine, New Orleans.

The subcommittee on hospitals includes Dr. Winford H. Smith, director of Johns Hopkins Hospital, Baltimore, chairman; Rev. Alphonse M. Schwitalla, president, Catholic Hospital Association of United States and Canada, St. Louis; Dr. Malcolm T. MacEachern, associate director of the American College of Surgeons, Chicago; Dr. Claude W. Munger, chairman of the defense committee of the American Hospital Association, New York, and Dr. Nathaniel W. Faxon, superintendent of the Massachusetts General Hospital, Boston.

The subcommittee on industrial medicine was set up with Dr. Clarence D. Selby, medical consultant of General Motors Corporation, Detroit, as chairman. Other members of this subcommittee included Prof. Philip Drinker, Harvard School of Public Health, Boston; Dr. E. C. Holmblad, Chicago; Dr. George M. Smith, Yale University Medical School, New Haven, Conn.; Dr. Lloyd Noland, chief surgeon, Tennessee Coal, Iron and Railroad Company, Fairfield, Ala.; Mr. William P. Yant, Mine Safety Appliance Company, Pittsburgh, and Dr. A. J. Lanza of the Metropolitan Life Insurance Company, New York.

A subcommittee on dentistry was named with the following members: Dr. C. Willard Camalier, Washington, D. C., former president of the American Dental Association, chairman; Dr. John T. O'Rourke, dean of the University of Louisville School of Dentistry; Dr. Leroy M. S. Miner, dean of the Harvard University Dental School, Boston; Dr. Frederick B. Noyes of Chicago and Dr. Guy S. Millbury of San Francisco, former dean of the Dental School of the University of California.

Miss Mary Beard, director of nursing of the American Red Cross, was named chairman of a subcommittee on nursing, and Dr. M. S. Bousfield of the Julius Rosenwald Fund, Chicago, will head a subcommittee on Negro health.

In announcing these subcommittees, Dr. Abell stated that these subcommittees would assist the Defense Council's Medical Committee in coordinating health and medical activities and in "mobilizing the medical resources of the nation for national defense."

Other members of the Health and Medical Committee on national defense as appointed by the President and the National Defense Council are Major General James C. Magee, Surgeon General of the Army; Rear Admiral Ross T. McIntyre, Surgeon General of the Navy; Dr. Thomas Parran, Surgeon General of the United States Public Health Service, and Dr. Lewis H. Weed, chairman of the Division of Medical Sciences of the National Research Council.

The general committee has already had two meetings and, in addition to setting up its various subcommittees, has considered the need for developing research projects dealing with special problems of military medicine and hygiene. Examples of such special problems are finding better methods of treatment of war wounds, exploring the most modern usages of recently discovered chemicals in the treatment and prevention of disease, problems of aviation medicine, and the most effective measures for the control of the venereal diseases.

The committee is also concerned with the necessity for providing health services in areas surrounding military camps and cantonments and with the health and medical problems arising as a consequence of the greatly expanded industrial development in certain regions of the country.

The committee hopes to find ways and means of providing adequate medical facilities and personnel, including hospitals, physicians and surgeons, dentists and nurses for the armed forces of the nation without the serious disruption of these essential services on the home front. It is enlisting the services and coordinating the efforts of both governmental and private agencies in building up the health and medical facilities of the nation as part of the present peacetime mobilization.

EXAMINATION FOR ARMY MEDICAL CORPS

An examination of applicants for appointment as first lieutenant, Medical Corps, U. S. Army, will be held within the continental limits of the United States, March 10-13, 1941, inclusive. Applications and requests for information concerning this examination should be addressed to the Adjutant General, U. S. Army, Washington, D. C. Applications received after Feb. 20, 1941, will not be considered.

PHYSICAL STANDARDS UNDER SELECTIVE SERVICE

The physical standards governing the physical examination of registrants by the examining physicians of the Selective Service system are the same as those which have been developed by the United States Army Medical Corps for the examination of selected men at Army and Navy induction stations. The objective is to procure men who are physically fit for the rigors of general service. In brief the regulations say:

The registrant must be able to see well; have comparatively good hearing; have a heart able to withstand the stress of physical exertion; be intelligent enough to understand and execute military maneuvers, obey commands, and protect himself; and be able to transport himself by walking as the exigencies of military life may demand. Examining physicians will accordingly so construe these standards that the objective stated above may be realized.

Registrants are to be placed in three classes according to physical standards, which will make them acceptable for general military service, for limited military service or reject them for any military service. The physicians of the draft boards are to make a complete examination and to record minor defects as well as disqualifying defects. The Medical Advisory Boards are to make additional and repeated examinations and special reports. In localities where there is no provision for serologic and other laboratory work, the examining physicians will consult municipal or state health authorities, the United States Public Health Service or other federal agencies.

The examiners are not permitted to give an anesthetic to a registrant without his voluntary consent for the purpose of examination or to aid in the diagnosis of defects.

The final decision as to the acceptance or rejection of men will, of course, rest with the physicians at the induction stations.

Reportable diseases are to be notified to appropriate civil authorities when found by the examining physicians of the Selective Service boards.

Venereal Disease

The regulations regarding venereal disease follow:

a. Whenever the history or the physical examination of a registrant indicates the possibility of venereal disease, the matter shall be thoroughly investigated, employing such additional examinations and laboratory tests as are deemed necessary to determine the presence of disqualifying sequelae or of contagiousness. A serological test for syphilis shall be made on every registrant as part of his physical examination. The blood specimen will be taken by the examining physician in containers furnished by the State Health officer and forwarded to the State Laboratory or other laboratory designated by State Selective Service Headquarters, together with the accomplished forms prescribed within the State for such purpose. A second serological test shall be completed promptly and prior to his call for induction on every registrant whose first test is reported positive. The dates and results of such examinations and tests shall be noted on the Report of Physical Examination (Form 200).

b. A diagnosis of syphilis shall not be made on the basis of a single positive serological test in the absence of definite clinical manifestations of the disease.

c. A diagnosis of latent syphilis shall be made on a registrant who has no clinical manifestations of the disease, but whose blood serum has been found positive by a second serological test performed under these regulations and within three months of the first positive serological examination.

d. Syphilis shall be considered contagious only in the presence of skin or mucous membrane lesions manifested within five years from the date of infection.

Each board is to have one physician, but additional appointments may be made if more than one examining physician is needed. An examining physician is not permitted to examine for a board any registrant who is a first cousin or a closer relation, either by blood or by marriage, or who is an employer or an employee, or who stands in the relation of superior or subordinate in connection with any employment, or is a partner or close business associate of the physician. In such instances the board may request another physician or the use of the examining physician of another board.

Each of the Advisory Boards is to have, if practicable, internists, eye, ear, nose and throat specialists, orthopedists, surgeons, psychiatrists, clinical pathologists, radiographers and dentists.

Cases Sent to Medical Advisory Boards

The local board will send registrants to the nearest Medical Advisory Board whenever the examining physician or the government appeal agent so requests or whenever a majority of the local board is dissatisfied with the conclusions of the examining physician.

Standards and Minimum Acceptable Measurements of Height, Weight and Circumference of Chest

Standard			Minimum	
Height, Inches	Weight, Pounds	Chest Measurement at Expiration, Inches	Weight, Pounds	Chest Measurement at Expiration, Inches
60	116	31¼	105	28¼
61	119	31½	107	29
62	122	31¾	109	29¼
63	125	32	111	29½
64	128	32¼	113	29¾
65	132	32½	115	30
66	136	32¾	117	30¼
67	140	33	121	30½
68	144	33¼	125	30¾
69	148	33½	129	31
70	152	33¾	133	31¼
71	156	34	137	31½
72	160	34¼	141	31¾
73	164	34½	145	32
74	168	34¾	149	32¼
75	172	35	153	32½
76	176	35¼	157	32¾
77	180	35½	161	33
78	184	35¾	165	33¼

Any one with an infectious disease will obviously not be selected for military service. If, however, he has recovered from such a condition and has not had any complications which remain permanently, he would be inducted. If he is drawn in the selective service at the time when he is ill, his acceptance is merely deferred until final examination shows that he has recovered.

This applies also to malaria, hookworm or to any recent injury such as wound of the hand. The existence of such an injury will not bar the young man from service but would merely defer his acceptance.

On the other hand, the presence of cancer or any other malignant disease, of active tuberculosis, leprosy, rheumatic fever or severe infection of the bones—or even severe hookworm infection, which might require months

for recovery—would be sufficient to put the registrant in the class that is not to be called for any type of military service.

In the accompanying table are given standards and minimum acceptable measurements of height, weight and the circumference of the chest.

Any one who falls within these standards is considered suitable for general military service, even one whose weight is greater than the standard indicated for the height, provided the overweight is not sufficient to interfere with military training. Thus the mere fact that a man is overweight will not in itself bar him from military service. Such a man may be selected for limited service or special service, provided he is not otherwise mentally and physically unfit.

The army cannot use men who are "outsize." The man who is less than 60 inches in height or less than 105 pounds in weight is simply too small for the army; the giant has the same trouble. Any one who is more than 6 feet 6 inches tall or whose weight is far out of proportion to his height is also considered to be outsize and will not be inducted into regular military service.

The examining board is given a good deal of discretion in matters of weight and height. If, in the opinion of the board, proper food and physical training will make a man capable of giving service, he is likely to be inducted into the service and to get just the proper food and training necessary to make him a physically fit specimen.

Eyes

Vision.—To determine the acuity of vision, place the person under examination with his back to a window at a distance of 20 feet from the test types. Examine each eye separately, without glasses, covering the other eye with a card (not with the hand). The registrant is directed to read the test types from the top of the chart down as far as he can see, and his acuity of vision is recorded for each eye, with the distance of 20 feet as the numerator of a fraction and the size of the type of the lowest line he can read correctly as the denominator. If he reads the 20 feet type correctly, his vision is normal and recorded 20/20; if he does not read below the 30 feet type, the vision is imperfect and recorded 20/30; if he reads the 15 feet type, the vision is unusually acute and recorded 20/15, and so on.

Class 1-A.—*a.* Normal vision. *b.* 20/100 in each eye without glasses, if correctable with glasses to 20/40 bilateral. *c.* Conditions due to iridectomy or other operation upon the eye, if the condition for which the operation was performed has been relieved and the vision is within or above the minimum standard requirements. *d.* Slight nystagmus. *e.* Slight conjunctivitis. *f.* Chronic simple conjunctivitis occurring in regions where trachoma is not prevalent and if easily remediable. *g.* Slight adhesion of the lids to the eyeball. *h.* Small pterygium. *j.* Strabismus which does not interfere with vision. *k.* Color blindness. *l.* Exophthalmos if not of such degree as to have led to, or threatened, corneal ulceration, and provided hyperthyroidism is excluded.

Class 1-B.—*a.* A minimum vision of 20/400 in each eye without glasses, if correctable with glasses to 20/40 in either eye. *b.* Loss of one eye or blindness in one eye not due to progressive organic change, with vision in the other eye of not less than 20/200 correctable to not less than 20/40. *c.* Superficial corneal ulcer, provided acceptance is deferred until ulcer is healed without disqualifying impairment of vision. *d.* The following conditions, if mild: (1) Chronic conjunctivitis not trachomatous. (2) Inversion of eyelids. (3) Eversion of eyelids. (4) Ptosis interfering with vision. (5) Trichiasis. (6) Epiphora. (7) Chronic blepharitis. (8) Extensive pterygium. (9) Chronic dacryocystitis. (10) Blepharospasm. (11) Diplopia due to paralysis of ocular muscles of one eye, if mild.

In **Class 4** are defects such as the following: *a.* Vision less than the minimum requirements for special and limited military service. *b.* Disfiguring cicatrices of eyes. *c.* Lagophthalmus, if associated with signs of hyperthyroidism. *d.* Pronounced exophthalmus. *e.* Chronic keratitis. *f.* Chronic recurrent inflammatory disease of the globe. *g.* Deep chronic ulcer of cornea. *h.* Any active disease of the retina, choroid, or optic nerve. *i.* Detachment of the retina. *j.* Marked nystagmus. *k.* Glaucoma. *l.* Diplopia due to paralysis of extrinsic ocular muscle, unless mild in degree. *m.* Abnormal conditions of eyes due to disease of the brain. *n.* Trachoma.

There are provided for the physicians of the boards complete instructions regarding the detection of malingering and other methods of examination, also instructions regarding retinoscopy.

Ears

Examination for Disease.—The external ears and mastoid region will be examined by inspection and, if necessary, the mastoid region by palpation. The external auditory canal and membrana tympani will be examined by reflected light or by a self-illuminating otoscope.

Determination of Auditory Acuity.—Acuity of hearing will be determined by the low conversational voice test and by the audiometer when indicated. To determine the acuity of hearing, place the registrant facing at right angles to the assistant, 20 feet distant, with ear to be tested toward assistant, and direct him to repeat promptly the words spoken by the assistant. If the registrant cannot hear the words at 20 feet, the assistant should approach foot by foot, using the same tone of voice, until the words are repeated correctly. Examine each ear separately, closing the other ear by pressing the tragus firmly against the meatus; the examiner may face the same direction as the registrant and close one of his own ears in the same way as a control. The assistant should speak in a low conversational voice (not a whisper), just plainly audible to the examiner, and should use numerals, names of places, or other words or sentences until the condition of the registrant's hearing is evident. The acuity of hearing should be expressed in a fraction, the numerator of which is the distance in feet at which the words are heard by the normal ear; thus 20/20 indicates a normal hearing, 10/20 partial hearing of a degree indicated by the fraction, that is, the registrant only hears at 10 feet distance the words which a normal ear hears at 20 feet. The duties of the examiner and assistant may be reversed if desired. If any doubt arises as to the correctness of the answer given, the registrant may be blindfolded and a watch be used to determine the distance at which it can be heard, care being taken that the registrant does not know the distance from the ear at which it is being held. The watch if used should be one whose ticking strength has been tested by determining the distance at which it can be heard by a normal ear. The audiometric examination will be conducted according to the method prescribed by the manufacturers of the instrument employed, and the findings as recorded on the prescribed form will be forwarded for file with the examination report.

In Class 1-A are *a.* Normal hearing. *b.* Hearing in each ear of 10/20 or better.

In Class 1-B are *a.* Hearing in one or both ears less than 10/20 but more than 5/20. *b.* Loss of one or both external ears, if the registrant has followed a useful vocation in civil life and the deformity is not too greatly disfiguring.

In Class 4 are defects such as *a.* Hearing less than the minimum hearing prescribed under class 1-B. *b.* Chronic purulent otitis media, with or without mastoiditis. *c.* Chronic perforation of membrana tympani.

Instructions are also provided for testing for malingering with directions for Erhard's test and the Chiman-Moos test.

Mouth, Nose, Fauces, Pharynx, Trachea, Esophagus and Larynx

In Class 1-A are *a.* Normal conditions of the mouth, nose, fauces, pharynx, larynx, trachea and esophagus. *b.* Enlarged tonsils. *c.* Adenoids. *d.* Small benign tumors of the nasal and

buccal mucous membrane. *e.* Deviation of the nasal septum or enlarged turbinates which do not seriously interfere with nasal breathing. *f.* Acute primary sinusitis, provided the acceptance of the registrant is temporarily deferred for reexamination, if after a reasonable time the sinusitis has disappeared. *g.* Laryngitis manifested by hoarseness, laryngeal cough, and congestion of the vocal cords, confirmed by laryngoscopy, unless tuberculous or malignant. *h.* Alleged stricture of the esophagus which is unattended by evidence of organic disease of the esophagus as shown by a fluoroscopic examination while the registrant is swallowing a barium mixture. *i.* Perforation of hard palate, if not associated with a disqualifying disease. *j.* Moderate deformity of the structures of the mouth which does not seriously interfere with mastication or speech. *k.* Hay fever, unless severe.

In Class 1-B are *a.* Deviation of the nasal septum, which markedly interferes with nasal breathing. *b.* Aphonia, with attendant conditions, which disqualify for general military service, if the registrant has followed a useful vocation in civil life. *c.* Hay fever, if severe.

In Class 4 are defects such as *a.* Irremediable deformities of the mouth, throat, and nose which interfere with the mastication of ordinary food, with speech, or with breathing. *b.* Destructive syphilitic diseases of the mouth, nose, throat, larynx, or esophagus, if severe in degree. *c.* Laryngeal paralysis, due to pressure from aneurysm or tumor. *d.* Permanent tracheostomy. *e.* Stricture of the esophagus. *f.* Permanent gastrostomy. *g.* Chronic sinusitis of the accessory sinuses of the nose, unless mild in degree. (The diagnosis should be established on chronic nasal discharge, presence of large nasal polypi, and other signs and symptoms reinforced by transillumination or x-ray examination, or both.) *h.* Chronic atrophic rhinitis with offensive odor (ozena).

Teeth

In Classes 1-A and 1-B are *a. Class 1-A.*—(1) Normal teeth and gums. (2) A minimum of three serviceable natural masticating teeth above and three below opposing and three serviceable natural incisors above and three below opposing. (Therefore, the minimum requirements consist of a total of six masticating teeth and of six incisor teeth.) All of these teeth must be so opposed as to serve the purpose of incision and mastication. (3) Definitions: (*a*) The term "masticating teeth" includes molar and bicuspid teeth, and the term "incisors" includes incisor and cuspid teeth. (*b*) A natural tooth which is carious (one with a cavity), which can be restored by filling, is to be considered as a serviceable natural tooth. (*c*) Teeth which have been restored by crowns or dummies attached to bridgework, if well placed, will be considered as serviceable natural teeth when the history and the appearance of these teeth are such as clearly to warrant such assumption. (*d*) A tooth is not to be considered a serviceable natural tooth when it is involved with excessively deep pyorrhea pockets, or when its root end is involved with a known infection that has or has not an evacuating sinus discharging through the mucous membrane or skin. *b. Class 1-B.*—Insufficient teeth to qualify for class 1-A, if corrected by suitable dentures.

In Class 4 are *a.* Irremediable disease of the gums of such severity as to interfere seriously with useful vocation in civil life. *b.* Serious disease of the jaw which is not easily remediable and which is likely to incapacitate the registrant for satisfactory performance of general or limited military service. *c.* Extensive focal infection with multiple periapical abscess, the correction of which would require protracted hospitalization and incapacity. *d.* Extensive irremediable caries.

Skin

Class 1-A.—*a.* Normal skin. *b.* Acute nonexanthematous and noncommunicable diseases of the skin which ordinarily run a temporary course. *c.* Diseases which are trivial in character and which do not interfere with the general health and are not incapacitating. Among these common and usually trivial diseases may be enumerated (1) Acne. (2) Anomalies of pigmentation. (3) Scars not extensive, disfiguring, nor incapacitating in character. (4) Condylomas which are not extensive. (5) Staphylococcic and streptococcic skin infections. (6) Acute eczemas. (7) Nevi which are not greatly disfiguring. (8) All forms of pediculosis. (9) All forms of ringworm, unless severe and not easily remediable. (10) Scabies, unless severe and not easily remediable. (11) Mild and not extensive psoriasis. (12) Warts. *d.* Simple ulcers or other acute defects of the skin which are easily curable. *e.* Pilonidal cyst or sinus if unattended with disease of the bone, as shown by x-ray examination. *f.* Unusual skin defects should arouse suspicion of self-inflicted lesions (dermatitis factitia).

Class 1-B.—Such defects as chronic diseases of the skin, which disqualify for general military service, if the registrant has successfully followed a useful vocation in civil life.

Class 4.—Serious or incapacitating skin disorders such as *a.* Chronic skin diseases or chronic ulcers of the skin which are so severe or so disfiguring as to incapacitate the registrant for the duties of a soldier or so disfiguring as to render the registrant objectionable in common social intercourse. *b.* Actinomycosis. *c.* Dermatitis herpetiformis of long duration. *d.* Epidermolysis bullosa. *e.* Forms of generalized dermatitis of long duration. *f.* Allergic dermatoses if severe and not easily remediable. *g.* Mycosis fungoides. *h.* Chronic pemphigus. *i.* Lupus vulgaris. *j.* Syphilitic lesions ulcerative in character showing much destruction of tissue which if healed would be unsightly or so scarring as to incapacitate the registrant for military service. *k.* Elephantiasis.

Head

Class 1-A.—*a.* Normal skull. *b.* Moderate deformities of the bones of the skull of the character of depressions, exostoses, and the like and unassociated with evidence of disease of the brain, spinal cord or peripheral nerves, and which would not prevent the registrant from wearing military headgear. *c.* Defects which are apparently temporary in character due to recent injuries. (This includes contusions and other wounds of the scalp and concussion. Registrants with these defects should have the final examination temporarily deferred.)

Class 1-B.—Osseous defects due to decompression or trephine of the skull, if asymptomatic and unassociated with bulging at the site of operation.

Class 4.—*a.* Deformities of the skull of the nature of depressions, exostoses, etc., of a degree which will prevent the registrants from wearing military headgear. *b.* Deformities of the skull of any degree associated with evidences of disease of the brain, spinal cord, or peripheral nerves. *c.* Hernia of brain; monstrosity of the head or hydrocephalus.

Spine, Scapulas and Sacro-Iliac Joints

Class 1-A.—*a.* Normal spine and scapulas. *b.* Lateral curvature of the spine of 2 inches or less from the normal midline, if the mobility and weight-bearing power are good. *c.* Fracture of the coccyx. *d.* Prominent scapulas not interfering with wearing of uniform or military equipment. *e.* Pilonidal cyst or sinus (this usually presents itself in the region between the coccyx and anus), if unattended with disease of the bone as shown by x-ray examination. *f.* Normal sacro-iliac and lumbosacral joints. *g.* Complaint of disease of the sacro-iliac and lumbosacral joints which is unassociated with objective signs and symptoms at the first examination and which, on reexamination after a reasonable period of time, is again found negative.

Class 1-B.—*a.* Lateral deviation of the spine from the normal midline of more than 2 inches and less than 3 inches. *b.* Nontuberculous diseases of the spine which are unassociated with such rigidity that the registrant has been incapacitated from following a useful vocation in civil life. *c.* Fracture of the spine or pelvic bones which has healed without marked defects and which has not interfered with following a useful vocation in civil life. *d.* Disease of the sacro-iliac and lumbosacral joints of a degree which disqualifies for general military service, if the registrant has followed a useful vocation in civil life.

Class 4.—Defects such as *a.* Tuberculosis, either active or healed, of any portion of the vertebral column. *b.* Osteoarthritis, partial or complete, of the spinal column if sufficient in degree to interfere with following a useful vocation in civil life. *c.* Healed fractures of the vertebrae or pelvic bones with associated disqualifying rigidity. *d.* Lateral deviation of the spine from the normal midline of more than 3 inches. Curvature

of the spine (kyphosis or lordosis) of a degree sufficient to interfere with the wearing of a uniform or military equipment, or which has prevented the registrant from following a useful vocation in civil life. *e*. Disease of the sacro-iliac and lumbo-sacral joints which is of a chronic type and is obviously associated with pain referred to the lower extremities, muscular spasm, postural deformities, and limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.

Use of X-Rays.—When examining physicians are in doubt concerning the cause and the extent of the diseases of the vertebrae, scapulas or sacro-iliac joints, an x-ray examination should be made.

Extremities

Class 1-A.—*a*. Normal upper and lower extremities with normal function. *b*. Old or recent fractures which have healed spontaneously with no resulting impairment of function. *c*. Paralysis of a muscle or group of muscles that does not interfere with function. *d*. Benign tumors of bone or defects due to their removal when the condition does not interfere with the function of the extremity or the joint involved. *e*. Recent injury of a bone or joint with or without fracture or dislocation which, in the opinion of the examiners, is only temporarily incapacitating. (Registrants with these defects should be given a period of time not less than six weeks for recovery before the final examination is made.) *f*. Web fingers and toes, unless severe in degree. *g*. Absent left thumb. *h*. Loss of two fingers of either hand, except a combination of right index and middle finger. *i*. Loss of right index finger, provided right middle finger is present. *j*. Scars and deformities of moderate degree of the hand or hands which do not interfere with normal function. *k*. Stiff fingers of a degree not to interfere seriously with function. *l*. Pes planus unless accompanied by marked deformity, rigidity or weakness, or is of such degree as to have interfered with useful vocation in civil life. *m*. Hallux valgus unless severe. *n*. Clubfoot of slight degree if tarsal, metatarsal, and phalangeal joints are flexible and the condition permits the wearing of a military shoe and, in the opinion of the examiner, will not interfere with the performance of military duty. *o*. Slight claw toes not involving obliteration of the transverse arch and which do not interfere with the wearing of a military shoe. *p*. Hammer toe which is flexible and which does not interfere with the wearing of a military shoe. (Hammer toe usually involves the second digit and unless it is rigid is not a disqualifying defect.) *q*. Absence of one or two of the small toes of one or both feet if the function of the foot is good. *r*. Ingrowing toenails.

Class 1-B.—*a*. Loss of thumb of right hand. *b*. Loss of three fingers of either hand, including the right index finger. *c*. Web fingers or toes, if severe in degree. *d*. Ganglion and other benign tumors of the hand or fingers. *e*. Moderate deformities of one or both upper extremities which do not and have not interfered with function to a degree to prevent the registrant from following a useful vocation in civil life. *f*. Internal derangement of the knee joint if not severe enough to have prevented him from following a useful vocation in civil life. *g*. Abduction and pronation (knock-ankle) when this condition is not associated with rigidity of the tarsal joint or with deformity of the foot. (This defect is remediable with proper foot exercises and with correct shoes.) *h*. Loss of great toe. *i*. Loss of dorsal flexion of great toe. *j*. Hammer toe with rigidity. *k*. Other defects of the feet which disqualify for general military service but do not prevent the registrant from wearing a military shoe and which have not prevented him from following a useful vocation in civil life. *l*. Moderate deformities of one or both lower extremities which do not and have not interfered with function to a degree to prevent the registrant from following a useful vocation in civil life. *m*. Adherent scars of the skin and soft tissues of an extremity. *n*. Ununited fractures which do not interfere with good function. *o*. Benign tumors of bone or joint which do not interfere with function. *p*. Healed disease or injury of wrist or elbow with resulting limitation of motion. *q*. Other defects which, in the opinion of the examining physician, are disqualifying but remediable, but which have not prevented the registrant from following a useful vocation in civil life.

Class 4.—Defects such as *a*. Loss of both thumbs. *b*. Loss of more than three entire fingers of one hand. *c*. Chronic inflammatory disease of long duration of one or more of the large joints, with or without sinuses. *d*. Tuberculosis of a bone or joint. (The diagnosis should be based upon the presence of swelling, tenderness, muscular spasm, restriction of joint motion and the evidence of bone destruction shown by x-ray examination. *e*. Old ununited fractures which interfere with function or ununited fractures with deformity sufficient to interfere with function. *f*. Old unreduced dislocations which have interfered with the registrant following a useful vocation in civil life. *g*. Disease of any bone or joint healed with such resulting deformity or rigidity that the function is impaired to a degree that it will interfere with military service. *h*. Muscle paralysis or contraction which disturbs function to the degree of interference with military service. *i*. Adherent scars of skin or soft tissue to a degree which seriously interfere with function. *j*. Varicose veins, if severe in degree or if associated with edema or ulcer of the skin. *k*. Pes planus, if accompanied by marked deformity, rigidity, or weakness, or of such degree as to have interfered with useful vocation in civil life. *l*. Obliteration of the transverse arch associated with permanent flexion of the small toes (claw toes). *m*. Hallux valgus if severe and associated with marked exostosis or bunion, especially when there are signs of irritation above the joint. *n*. Clubfoot if marked in degree or which interferes with the wearing of a military shoe. *o*. Diseases of the bone or of the hip, knee, or ankle joint which seriously interfere with function and weight bearing power. *p*. Deformities due to fracture or other injury which seriously interfere with function and weight bearing power. *q*. Sciatica which is apparently intractable and disabling to the degree of interference with the function of walking and weight bearing power. *r*. Amputations of extremities in excess of those already cited.

General Considerations.—It is important that registrants with defects of the feet which are not remediable by training and which prevent the inducted men from taking proper training should not be accepted for general military service. It is quite as important that defects of the feet which are not disabling should not be considered disqualifying for general military service.

Neck

Class 1-A.—*a*. Normal neck. *b*. Nonspastic contraction of the muscles of the neck which is not of great degree and will not prevent the wearing of a uniform or military equipment. *c*. Simple goiter or benign thyroid tumors unassociated with toxic or pressure symptoms, provided the enlargement of the thyroid will not interfere with the wearing of a uniform or military equipment. *d*. Enlarged lymph glands of the neck which are not a manifestation of systemic disease and which apparently do not interfere with the general health and which are not large enough to interfere with the wearing of a uniform or military equipment.

Class 4.—*a*. Exophthalmic goiter. *b*. Thyroid enlargement from any cause associated with toxic symptoms. *c*. Enlargement of the lymph glands of the neck associated with leukemia and Hodgkin's disease. *d*. Lymphosarcoma. *e*. Tuberculous glands. *f*. Nonspastic contraction of the muscles of the neck or cicatricial scarring which is disfiguring and unsightly or interferes with wearing a uniform or military equipment. *g*. Spastic contraction of the muscles of the neck. *h*. Simple goiter unassociated with toxic or pressure symptoms, enlarged lymph glands of the neck, benign tumors and cysts of the neck, large benign tumors of the parotid gland, if the enlargement is of such degree as to interfere with wearing a uniform or military equipment.

Lungs and Chest Wall

Class 1-A.—*a*. Normal respiratory system and chest wall. *b*. Acute bronchitis, provided acceptance is temporarily deferred until a final examination shows recovery without disqualifying sequelae. *c*. Scars of operation for empyema which have been healed for one year or longer, when the function of the lung is good. *d*. (1) Arrested pulmonary tuberculosis consisting of lesions appearing in x-ray examination as small apical scars,

small calcified nodules or localized fibrous strands, in no case exceeding minimal extent as defined in the classification of the National Tuberculosis Association, and when, in addition, in the opinion of the examining physician, this lesion is not likely to be reactivated under conditions of military service. (2) Minimal pulmonary lesions are defined as slight lesions without demonstrable excavation confined to a small part of one or both lungs. The total extent of the lesions, regardless of distribution, will not exceed the equivalent of the volume of lung tissue which lies above the second chondrosternal junction and the spine of the fourth or body of the fifth thoracic vertebra on one side. *e.* Fracture of the rib or ribs, provided acceptance of registrant is temporarily deferred until a final examination shows recovery with or without deformity, and provided the residual deformity, if any, does not interfere with respiratory movements. *f.* Benign tumors of the breast or of the chest wall, provided the enlargement does not interfere with the wearing of a uniform or military equipment. *g.* Small palpable lymph glands of the axilla which apparently do not interfere with the general health.

Class 1-B.—*a.* Deformity of clavicle, ribs, or scapula of a degree disqualifying for general military service but which has not prevented the registrant from successfully following a useful vocation in civil life. *b.* Chronic bronchitis, bronchiectasis, or chronic asthma which is mild and which has not prevented the registrant from successfully following a useful vocation in civil life.

Class 4.—Disqualifying defects such as *a.* Tuberculosis of lungs or tracheobronchial lymph nodes, except as defined for Class 1-A. *b.* Fibrinous or serofibrinous tuberculous pleuritis, and pleurisy, with effusion of unknown origin. (As pleurisy, with or without effusion, is a very frequent manifestation of early tuberculosis, examining physicians should examine with the greatest care registrants who have apparently recovered from pleurisy.) *c.* Empyema, or unhealed sinuses of the chest wall following operation for empyema. *d.* Chronic bronchitis with emphysema except as stated for Class 1-B. *e.* Chronic asthma associated with chronic bronchitis and emphysema, except as stated for Class 1-B. *f.* Abscess of the lung. *g.* Bronchiectasis, if moderate or severe. *h.* Actinomycosis. *i.* Tuberculosis of the ribs and other parts of the chest wall. *j.* Tumor of the breast or of the chest wall of such size and location as to interfere with the wearing of the uniform or military equipment. *k.* Tumor of the lung, pleura, or mediastinum. *l.* Spontaneous pneumothorax.

General Considerations.—*a.* The chest examination will include the usual methods of physical diagnosis supplemented, whenever indicated, by radiographic and laboratory studies. *b.* Examining physicians should be extremely careful to reject registrants with pulmonary tuberculosis, except as defined for Class 1-A for all military service; and to accept for military service registrants who allege tuberculosis as a ground for exemption or discharge on the basis of insufficient or incorrectly interpreted signs and symptoms. *c.* Men who desire to serve their country may conceal, from patriotic motives, symptoms of tuberculosis which they know or suspect to exist. Some tuberculous individuals will seek enlistment with a view to obtaining treatment and a pension. Some soldiers may allege symptoms of tuberculosis with a view to securing discharge. Some registrants may be expected to claim the existence of tuberculosis as a ground for exemption and fortify their claims by certificates of physicians and by roentgenograms. Such certificates and roentgenograms will not be accepted, but examining physicians will satisfy themselves as to the physical qualifications of registrants by their personal examinations. There will be cases in which pulmonary tuberculosis will have been previously diagnosed on the ground of subjective symptoms and of physical signs which are without any pathologic significance. It is necessary, therefore, that conclusions of examining physicians will be based only on their own examinations. Statements of the registrant as to symptoms will not be accepted as indication of the existence of tuberculosis unless supported by objective evidence. *d.* The attention of examining physicians is particularly invited to the necessity of exercising great conservatism in their interpretation of physical signs over the apexes. Interpretation of such signs as indicating active tuberculosis would in many cases do the government great injustice, leading to the exclusion of men who are fit for service. *e.* The following signs may arouse suspicion, but unless x-ray and other studies reveal definite evidence of disease they will be disregarded. (1) Slightly harsh breathing, slightly prolonged expiration over the right apex above the clavicle anteriorly and to the third dorsal vertebra posteriorly; the same signs at the extreme apex, left side. (2) Same signs at second interspace right anteriorly near sternum (proximity of right main bronchus). (3) Increased vocal resonance, slightly harsh breathing immediately below center of left clavicle. (4) Fine crepitations over sternum heard when stethoscope touches the edges of that bone. (5) Clicks heard during strong respiration or after cough in the vicinity of the sternocostal articulations. (6) The so-called rales at the apex during the first inspiration which follows a deeper breath than usual or a cough. (7) Sounds resembling rales at base of lung (marginal sounds), especially marked in right axilla, limited to inspiration. (8) Similar sounds heard at apex of heart on cough (lingula). (9) Slightly prolonged expiration at left base posteriorly. (10) Very slight harshness of respiratory sounds with prolonged expiration in the lower paravertebral regions of both lungs posteriorly.

Heart, Blood Vessels and Circulation

History.—Questions may be asked during the course of the xamination concerning past history of rheumatic fever, syphilis and reaction of physical effort which may be helpful in the interpretation of the observations, but reliance should not be placed on the history alone.

Procedure.—The procedure following should govern in the physical examination of the heart. Only those observations need be recorded which are indicative of disease or anatomic defect (examples of conditions which are usually not indicative of disease are extrasystoles and functional pulmonary systolic murmurs). For the information of the examiners it is suggested that reference be made to the publication of the American Heart Association entitled "The Nomenclature and Criteria for the Diagnosis of Diseases of the Heart." *a.* Location and determination of character of apex impulse. *b.* Auscultation of the heart sounds over apex, lower sternum, and second and third interspaces to right and left of sternum, noting accentuation of sounds and murmurs, and rate and rhythm, and comparing apex observations with the radial pulse. *c.* Inspection of root of neck and upper thorax and percussion of first interspace on each side of manubrium for evidence of aneurysm. *d.* Count of radial pulse, observation of its rhythm, and palpation of radial arteries for unusual thickening or high tension. *e.* The blood pressure will be determined only in those cases in which it appears indicated. *f.* Exercise test (stepping twelve times briskly onto a common chair) will be used in selected cases to bring out significant heart murmurs, but this test in itself is not to be considered a reliable estimate of the functional capacity of the heart. Care will be taken that registrants with heart lesions are not placed in jeopardy by overexercise. *g.* If there is doubt as to the presence of cardiovascular disease the registrant should return for detailed reexamination.

Class 1-A.—*a.* Normal heart. (A heart will be considered normal when the apex impulse is within the left midclavicular line and not below the fifth interspace; when sounds are normal and there are no thrills or important murmurs; when there is no abnormal pulsation or dulness above the base of the heart; when pulse rate is normal and regular and there is no unusual thickening of the arteries or evidence of high blood pressure.) *b.* A pulse rate of 100 or over which is not persistent. (A pulse rate of 100 or over may be temporary and due to excitement or to recent infection, such as pneumonia or local infections about the nose, mouth and throat, or may be induced by drugs.) *c.* A pulse rate of 50 or under which is proved to be the natural pulse rate of the registrant or to be temporary or due to the use of drugs. *d.* Sinus irregularity. (This consists in a quickening of the pulse rate during inspiration and a slowing during expiration and is best recognized with the registrant recumbent and breathing deeply.) *e.* Elevation of blood pressure from excitement, proved to be temporary. *f.* Neurocirculatory asthenia, if mild in degree.

Class 1-B.—There are no cardiovascular criteria to warrant initial selection for class 1-B.

Class 4.—*a.* Circulatory failure evidenced by definite symptoms such as a combination of breathlessness, cyanosis and edema. *b.* Hypertrophy and dilatation of the heart evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib, and of a heaving or diffuse character. *c.* A persistent heart rate of 100 or over when this is proved to be persistent in the recumbent posture and on observation and reexamination over a sufficient period of time. *d.* Paroxysmal tachycardia. *e.* Heart block. *f.* Any serious disturbance of rhythm, such as auricular fibrillation. *g.* Valvular disease. *h.* Congenital heart disease. *i.* Persistent blood pressure at rest above 150 mm. systolic or above 90 diastolic, unless in the opinion of the medical examiner the increased blood pressure is due to psychic reaction and not secondary to renal or other systemic disease. *j.* Thrombophlebitis of one or more extremities if there is a persistence of the thrombus or any evidence of obstruction of circulation in the involved vein or veins. *k.* Other abnormalities of the peripheral vascular system, including large varicose veins, Raynaud's disease, Buerger's disease (thrombo-angiitis obliterans), erythromelalgia, and arteriosclerosis of the leg vessels. In doubtful cases special tests should be employed. *l.* Aneurysm of any vessel. *m.* Pericarditis. *n.* Acute endocarditis. *o.* Angina pectoris clearly due to coronary insufficiency. *p.* Coronary thrombosis. *q.* Neurocirculatory asthenia (effort syndrome), unless mild.

Electrocardiogram. — The electrocardiogram is of great assistance in determining the nature of certain cardiac abnormalities, the most important of which are the various arrhythmias, defects in conduction, and diseases of the coronary arteries. The electrocardiograph may be utilized in cases in which such diagnostic aid is especially indicated but will not be employed as a routine measure.

X-Ray Examination. — In doubtful cases fluoroscopy is advised to determine the size and shape of the heart and great vessels. Such films as may be taken for the study of the lungs of the registrants should also be viewed for cardiovascular defects.

General Considerations.—*a.* It is incumbent on examining physicians (1) To accept for service men with accidental functional murmurs or other conditions which do not indicate disease and do not impair the individual's ability to undergo severe bodily exertion. (2) To exclude from active service in the Army any registrant affected with disease of the heart or blood vessels which impairs his ability to undergo severe bodily exertion. Although many men with compensated valvular heart disease are able to undergo severe bodily exertion, the question of aggravation in service, especially by activation of rheumatic carditis, is likely to arise and incidentally to create a pension problem. Therefore all registrants with valvular heart disease are to be regarded as unfit for service and will be placed in class 4. *b.* Men who desire to serve their country may from patriotic motives endeavor to conceal a known valvular lesion which has given no symptoms. On the other hand, men drafted for service may allege or feign symptoms to obtain exemption. Registrants may be expected to present physicians' certificates to substantiate the existence of valvular disease. Many of these may be given in good faith because of inadequate knowledge of the significance of certain frequent murmurs. Such certificates will not be accepted, but examining physicians will satisfy themselves by their personal examinations as to the physical qualifications of registrants. *c.* It is necessary, therefore, that the conclusions of the examining physician in doubtful cases will be based on objective evidence in the widest sense, including both physical signs, cardiac rhythm, measurement of blood pressure, and the observed effect of effort. Nevertheless, in the presence of questionable signs or symptoms, the history, especially of past rheumatic fever may be a factor in the final decision. No statement, however, will be accepted as proof of the existence of a cardiovascular defect unless supported by objective evidence. *d.* Since it is the duty of examining physicians to protect the interests of the government by preventing men from entering the service whose circulatory systems may be expected to break down under strain, and equally by preventing the exemption or discharge of fit subjects because of unimportant deviations from the normal, it will be necessary for them to exercise care in the interpretation of their observations and to bear in mind constantly the murmurs and other departures from the supposed normal which may occur in perfectly healthy hearts.

Abdominal Organs and Wall

Class 1-A.—*a.* Normal abdominal organs and abdominal wall. *b.* Abdominal scars due to surgical operation or accident which show no hernial bulging. *c.* Scar pain when found not associated with any disturbance of function of abdominal wall or contained viscera, unless malingering is definitely excluded. *d.* Achylia gastrica, unless associated with a disqualifying disease. *e.* Complaint of weak stomach, indigestion, dyspepsia, constipation, belching, vomiting, and various other types and degrees of abdominal discomfort which are proved by examination not to be associated with organic disease, by the absence of the usual objective symptoms and signs and by such laboratory tests as may be employed, provided psychiatric examination reveals no disqualification. *f.* Blood in stools if proved to be due to slight defects, such as fissures of the anus, small hemorrhoids or superficial small ulcers of the rectum. *g.* Mild enlargement of the liver unassociated with other objective evidence of disease of the liver or other organs. *h.* Splenic enlargement of mild degree unassociated with evidence of other disqualifying disease. *i.* Small benign tumors of the abdominal wall. *j.* Intestinal parasites or their eggs in the stools. *k.* Internal and external hemorrhoids if mild in degree.

Class 1-B.—Unless the degree of disability is obviously disqualifying, *a.* Hernia-inguinal, femoral, umbilical and postoperative. *b.* Large benign tumors of the abdominal wall. *c.* Internal hemorrhoids moderately severe, if remediable.

Class 4.—Defects such as *a.* Inoperable hernia. *b.* Hydatids of the liver. *c.* Ulcer of the stomach or duodenum, if diagnosis is confirmed by the usual laboratory procedures. *d.* Obstruction of the bowel due to organic disease. *e.* Irremediable sinuses of the abdominal wall communicating with the hollow viscera. *f.* Irremediable stricture of the rectum. *g.* Multiple fistulas of the anus. *h.* Schistosomiasis. *i.* Enlargement of the spleen associated with leukemia, Hodgkin's disease or splenic anemia. *j.* Great enlargement of the spleen from any cause. *k.* Large internal and external hemorrhoids associated with prolapse of the rectum. *l.* Paralysis of the sphincter associated with incontinence of feces.

General Considerations.—*a.* When necessary to confirm a diagnosis, examining physicians should, when possible avail themselves of fluoroscopy and roentgenography when examining registrants. *b.* When examining physicians are able to command hospital facilities and the necessary diagnostic apparatus, they should, within their discretion, use test meals and chemical and microscopic examination of the stomach contents and stools. *c.* Examining physicians should make use of digital rectal examination of defects referable to that region, and, when necessary, proctoscopy should also be utilized. *d.* Registrants who are found to have parasites or their eggs in stools should have this condition indicated on report of examination. *e.* Moderate impulse produced by cough at the inguinal, femoral, or umbilical rings, or at the site of a scar is not necessarily indicative of hernia.

Genito-Urinary Organs and Venereal Diseases

Class 1-A.—*a.* Gonorrhea, acute or chronic. *b.* Syphilis with remediable manifestations except cerebrospinal, cardiovascular or visceral syphilis. *c.* Chancroids and the resulting infections of the lymph glands of the groin. *d.* Bed wetting, if mild in degree. *e.* Albuminuria with or without casts which is proved by observation and repeated examination to be temporary in character. *f.* Absence of one testicle due to removal or atrophy. *g.* Undescended testicle which lies within the abdominal cavity. *h.* Acute cystitis which has proved to be of a temporary character by observation and repeated examination over a period not to exceed six weeks. *i.* Phimosis with or without adhesions of the mucous surfaces, if remediable. *j.* Benign warts and other benign growths of the glans penis and of the prepuce. *k.* Amputation of the penis if a sufficient amount of the organ remains so as

not to interfere with the function of micturition. (Care should be taken to examine registrants fully for possible recurrence of a disqualifying disease for which the amputation was made.) *l.* Varicocele of moderate size. *m.* Hydrocele of moderate size.

Class 1-B.—*a.* Stricture of the urethra, unless severe and irremediable. *b.* Benign tumor of the testicles. *c.* Cystitis, subacute or chronic, if deemed remediable. *d.* Varicocele if large. *e.* Hydrocele, if large and considered irremediable to a degree which would qualify for class 1-A but would permit limited service. *f.* Floating kidney. (By floating kidney is meant one which is freely movable.) *g.* Undescended testis which lies within the inguinal canal. *h.* Removal of one kidney, the remaining one being healthy. *i.* Bed wetting if more than mild in degree.

Class 4.—*a.* Chronic nephritis. This should be evidenced by the presence in the urine of albumin and casts, with or without blood, over a period of time sufficient to prove the persistence of the urinary condition. Examining physicians should require registrants to void the urine during the period of the examination and in their presence. When albumin and casts are found in the urine, the registrants should be reexamined not less than twice a day on two or more separate days. If the urine shows albumin and casts with or without blood, and this condition of the urine is associated with enlargement of the heart, high blood pressure and other evidences of cardiovascular disease, the diagnosis of chronic nephritis may be made immediately. If the presence in the urine of albumin and of casts with or without blood is proved to be inconstant, and if the condition is unassociated with the cardiovascular condition mentioned, decision should lie within the judgment and discretion of the examining physicians. *b.* Irremediable stricture of the urethra, unless of such slight degree as to be of no pathologic significance. *c.* Urinary fistula or incontinence. *d.* Gonorrheal arthritis which is of itself disqualifying. *e.* Surgical kidney with or without renal calculus. *f.* Irremediable pyelitis. *g.* Hydronephrosis or pyonephrosis. *h.* Tumors of the kidney or bladder. *i.* Acute nephritis if moderately severe and persistent after one month's observation. *j.* Chronic cystitis associated with calculi or with retention of urine caused by stricture of the urethra or by disease of the central nervous system. *k.* Amputation of the penis if the resulting stump is insufficient to permit of normal function of micturition. *l.* Hermaphroditism. *m.* Hypertrophy of the prostate gland of sufficient degree to cause retention of the urine. *n.* Epispadias or hypospadias when urine cannot be voided in such a manner as to avoid soiling of clothing or surroundings, or when accompanied by evidence of chronic infection of the genito-urinary tract. *o.* Cardiovascular, cerebrospinal and visceral syphilis.

General Considerations.—*a.* When it is deemed necessary, examining physician should employ x-ray facilities to verify diagnosis of defects of the genito-urinary organs. *b.* Complications and sequelae of gonorrhea will be regarded by examiners as acceptable or as disqualifying, depending on the degree of seriousness in individual cases, and registrants will be appropriately classified according to the best judgment of the medical examiners.

Endocrine and Metabolic Disorders

Class 1-A.—*a.* Goiter (enlargement of thyroid gland, diffuse or nodular) if unassociated with toxic or pressure symptoms, provided the enlargement of the thyroid will not interfere with the wearing of a uniform or military equipment. *b.* Froelich's syndrome, if very mild in degree. *c.* Hypothyroidism without myxedema, if not severe or resistant to cure. *d.* Acromegaly if not severe or associated with symptoms other than the bony changes. *e.* Pellagra, beriberi, scurvy and other nutritional deficiencies, if remediable by correction of diet and not severe. *f.* Glycosuria, if transient or renal in type, provided acceptance is deferred until the possible existence of diabetes mellitus is excluded.

Class 1-B.—Froelich's syndrome, if moderate in degree.

Class 4.—*a.* Toxic goiter or thyrotoxicosis. (It should be remembered that malingerers may by use of thyroid medication produce many of the symptoms of thyrotoxicosis.) *b.* Goiter with definite pressure symptoms or so large in size as to interfere with wearing a uniform or military equipment. *c.* Cretinism with imbecility or dwarfism. *d.* Myxedema (with clinical manifestations, and diagnosis not based only on low basal metabolic rate). *e.* Gigantism or acromegaly if markedly disfiguring or if associated with other symptoms of severe pituitary dysfunction. *f.* Froelich's syndrome, if severe. *g.* Hyperparathyroidism and hypoparathyroidism, unless mild in degree. *h.* Addison's disease. *i.* Diabetes mellitus and diabetes insipidus. If sugar is found in the urine, further specimens should be voided in the presence of the physician or authorized assistant, and on more than one occasion to avoid the substitution of diabetic urine or the voiding of diabetic or dextrose containing urine previously introduced into the bladder by catheter. In doubtful cases the blood sugar should be determined. Before diabetes insipidus is diagnosed, malingering (by drinking a large quantity of water) should be excluded. *j.* Avitaminoses (including sprue, beriberi, pellagra and scurvy) which are severe or not readily remediable, or in which permanent pathologic changes have been established. *k.* Gout. *l.* Simmond's disease. *m.* Cushing's syndrome.

Diseases of the Blood and Blood-Forming Tissues

Class 1-A.—*a.* Secondary anemia, due to hemorrhoids or any other remediable cause. *b.* Purpura if symptomatic of a remediable condition. *c.* Sickle cell anemia, if not severe. *d.* Malaria, acute or chronic, unless severe and irremediable.

Class 1-B.—Primary pernicious anemia in the absence of posterolateral sclerosis, if responsive to treatment and not severe.

Class 4.—*a.* Hemophilia. *b.* Thrombocytopenic purpura. *c.* Primary pernicious anemia if severe, not responsive to treatment or with neurologic complications. *d.* Aplastic anemia. *e.* Hemolytic ictero-anemia (hemolytic jaundice). *f.* Splenic anemia. *g.* Polycythemia vera. *h.* Leukemia, acute or chronic, of any type.

Mental and Nervous Disorders

Class 1-A.—*a.* A normal nervous system. *b.* Registrants who appear to have normal understanding, whose speech can be understood, who have no definite signs of organic disease of the brain, spinal cord or peripheral nerves, and who are otherwise mentally and physically fit. *c.* Muscular tremors of moderate degree, unless malingering is definitely excluded.

Class 1-B.—*a.* Stuttering and stammering of a degree disqualifying for general military service but which has not prevented registrants from successfully following a useful vocation in civil life. *b.* Tremors of such marked degree that they disqualify for general military service but have not prevented the registrants from following a useful vocation in civil life.

Class 4.—Any serious mental or neurologic disorder such as *a.* Insanity. *b.* Epilepsy. *c.* Postencephalitic syndrome. *d.* Imbecility. *e.* Drug addiction, including the habitual use of opium and its derivatives and cocaine. *f.* Chronic alcoholism. *g.* Stammering to such a degree that the registrant is unable to express himself clearly or to repeat commands. *h.* Psychoneuroses and constitutional psychopathic states, provided the diagnosis is clearly established and in the opinion of the medical examiner precludes the successful performance of military duty. *i.* Chronic essential chorea. *j.* Syphilis of central nervous system. *k.* Post-traumatic cerebral syndrome. *l.* Multiple sclerosis. *m.* Paraplegia or hemiplegia. *n.* Syringomyelia. *o.* Muscular atrophies and dystrophies which are obviously disqualifying. *p.* Hysterical paralysis. *q.* Neuritis or neuralgia which is not temporary in character and which has progressed to such a degree as to prevent the registrants from following a useful vocation in civil life. *r.* Brain tumors. *s.* Cerebral arteriosclerosis. *t.* Sexual perversion.

Diagnostic Criteria.—In arriving at decisions concerning nervous or mental defects, the following criteria may be of assistance: *a. Insanity.*—All registrants should be considered insane who are committed, or who have been committed, to a licensed public institution for the care of the insane. The examining physicians may require proof in the form of verified records of commitment by the proper state authorities to verify the statements of the registrants. (1) *Dementia Praecox.*—Look for indifference, apathy, withdrawal from environment, ideas of reference and persecution, feelings of the mind being tampered with, or thought being controlled by hypnotic, spiritualistic or

other mysterious agencies, hallucinations of hearing, bodily hallucinations, frequently of electrical or sexual character; meaningless smiles; in general, inappropriate emotional reactions and lack of connectedness in conversation. There may be sudden emotional or motor outbursts. The history of family life and of school, vocational and personal career will usually show erratic and more or less irrational conduct. (2) *Manic-Depressive Insanity.*—Look for mild depression, with or without feeling of inadequacy, or mild manic state with exhilaration, talkativeness and overactivity. (3) *Paresis.*—The diagnosis of paresis may be made when at the examination of the registrant a majority of the following signs and symptoms are demonstrated: Argyll Robertson pupil, facial tremor, speech defect in test phrases and in the slurring and distortion of words in conversation; writing defects, consisting of omissions and the distortion of words; apathetic or depressed or euphoric mood. These registrants may show memory loss or discrepancies in relating facts of life; the knee jerks may be plus, minus or normal. *b. Epilepsy.*—The registrant will not be considered epileptic unless the claim is substantiated by characteristic scars on the tongue, face or head or, if the examining physician is in doubt, by properly certified proof. *c. Imbecility.*—A registrant will be declared an imbecile who has been so defective in mind from birth or early age as to be incapable of earning a livelihood but at the same time is able to guard himself against common physical danger. *d. Chronic Alcoholism.*—(1) A registrant will be declared a sufferer from chronic alcoholism when he presents a majority of the following symptoms and signs: suffused eyes; prominent superficial blood vessels of nose and cheek; flabby, bloated face; red or pale purplish discoloration of mucous membrane of the pharynx and soft palate; muscular tremor of the protruded tongue and extended fingers; tremulous handwriting. (2) The history of evidence presented that the registrant has been frequently and grossly intoxicated is not of itself sufficient proof for the diagnosis of chronic alcoholism. *e. Tabes.*—The diagnosis of this disease should be made when, at the examination of the registrant, several of the following signs and symptoms are present: Argyll Robertson pupil; absent knee jerks; positive Romberg, ataxic gait (especially when the eyes are closed); hypotonia, and anesthetic areas of the skin. The history of tabes is usually that of slow progression, of failing sexual power, and pains in the legs or back which are often described as rheumatism. *f. Cerebrospinal Syphilis.*—The prominent diagnostic signs and symptoms are headaches, varying deep and superficial reflexes, pupillary changes, ptosis, ocular palsies, facial weakness; the mental state may be normal, dull or apathetic. Comparative motor weakness may involve one side of the body or one extremity. *g. Multiple Sclerosis.*—The diagnosis of this disease rests on the following signs and symptoms: intention tremor, nystagmus, absent abdominal reflexes, increased tendon reflexes, and scanning speech; in cases of this kind the history obtained is not characteristic, but sometimes there may be a history of urinary disturbances. *h. Paraplegia.*—The diagnosis of paraplegia from whatever cause will rest on weakness of the lower extremities, associated with loss of or increased knee jerks, Babinski reflex or disturbance of the sphincters of the rectum and bladder, with or without girdle sensations. Sensory disturbance of the skin may or may not be present. Muscle sensibility may be diminished. *i. Syringomyelia.*—Syringomyelia is usually evidenced by more or less loss of power and atrophy of groups of muscles of one or more extremities; disturbance of the sensations of the skin, more especially in the form of analgesias, and diminution of the temperature sense; if in the upper dorsal cord, often associated with stooped shoulder posture; if in the lower dorsal, with weakness in one or both lower extremities. *j. Muscular Atrophies and Dystrophies.*—The signs and symptoms of muscular atrophies and dystrophies are atrophies of the small muscles of the hand and of the muscle groups of the shoulder; fibrillary twitchings. The history of these defects rarely furnishes reliable data, although it will usually be found that the registrant has shown evidences of awkwardness. There is never a history of pain in the affected muscles. *k. Multiple Neuritis.*—The chief manifestations are more or less pain in the course of the affected nerves, with tenderness over the trunks of the nerves and of the muscles supplied by them; lessened muscular power of varying degrees; more or less atrophy of muscles, with or without contraction, and evidences of trophic changes of the skin. The reflexes, deep and superficial, may be diminished or absent; the sphincters are not involved.

Sequelae of Organic Neurologic Disease.—Certain aftereffects of organic nervous disease need not be causes for rejection, provided *a.* The disease is no longer active and is not likely to recur. *b.* The effect left by it does not prevent a satisfactory fulfilment of military duties. Examples of such conditions are paralysis of a few unimportant muscles following poliomyelitis, slight unilateral hypertonicity as a result of an infantile hemiplegia in a man now rubust, and various traumatic conditions.

Purposely Caused Physical Defects

Report of Apparently Purposely Caused Defects.—Whenever it shall appear to an examining physician that a registrant is suffering from self-inflicted or purposely caused physical defects which, under the standards of physical examination prescribed herein, would render him disqualified for military service of any kind, a full statement of the facts and of the condition of the registrant and of the examining physician's recommendation will be prepared and submitted to the Director of Selective Service or other designated authority for a waiver of the physical defects, if recommended, so that the registrant may be compelled to render military service.

Notes on Malingering

Types of Malingerers.—Malingerers may be divided into three general groups: *a.* Real malingerers with nothing the matter with them, who injure themselves, or make allegations respecting diseases or such condition as drug taking, or who simulate disease with full consciousness and responsibility—all for the purpose of evading military service. Many of these will have been coached. *b.* The psychoneurotic, who are natural complainers and try to get out of every disagreeable thing in life; perhaps only partially conscious of the nature of the seriousness of what they do and only partly responsible. In many the motives are not persistent and many can be made into good soldiers. *c.* Confirmed psychoneurotic individuals with long history of nervous breakdowns and illnesses who behave like group *a* above but more persistently and from whom not much can be expected in the way of reconstruction.

Feigned Medical Diseases.—*a.* The detection and management of malingerers simulating medical diseases depend on the absence of positive signs in an individual who presents the general characteristics of the malingerer. There is especial need for the physical examination to be thorough in this group. Some of the cardiac cases at first regarded as malingering may later be found to be mitral stenosis or bacterial endocarditis. Similarly, proper tests may show the existence of peptic ulcers in those suspected of feigning digestive abnormalities. The estimation of the reality of rheumatic pains is always a difficult matter. *b.* Tachycardia and thyrotoxicosis may be temporarily induced by ingestion of drugs, such as thyroid extract. Egg albumin or sugar may be added to urine. Undiluted canned milk may be made to simulate the urethral discharge. Cantharides may be taken to cause albuminuria. Digitalis and strophanthus may be taken to cause abnormal heart action. The skin may be irritated by various substances. Cathartics may be taken to bring about purging or to simulate a chronic diarrhea. An appearance of hemoptysis may be produced by adding blood, either human or that of animals, to the sputum. Sometimes merely coloring matter is added. Those who can vomit voluntarily what they swallow use the same means to create the appearance of hematemesis. Similarly, coloring matter may be added to the stools. Mechanical and chemical irritants are made use of to cause inflammation about practically all the body orifices. Jaundice may be simulated by taking picric acid. Crutches, spectacles, trusses and strappings are made use of to create the appearance of disability. Artificial jaundice is recognized by demonstration of picric acid in the urine.

Feigned Surgical Conditions.—Under this are included old scars and injuries of the bones, fractures and orthopedic conditions. Men may have teeth extracted in an effort to evade military service. Others may shoot or cut off their fingers or toes, practically always on the right side, to disqualify

themselves for service. Some may put their hands under cars for this purpose. Retention of urine may be simulated. Substances may be injected under the skin to create abscesses. Crutches, braces, strappings or trusses may be used to give the appearance of disability. Wounds are rarely self inflicted when witnesses are present; consequently it is almost impossible to be certain of malingering in some cases.

Nervous and Mental Feigned Illness.—*a. Insanity.*—Rarely feigned by registrants and then of an extremely silly, foolish type. In case of doubt, hospital observation is necessary, with verified past records. Mental defects are frequently feigned, especially by illiterates. Organic diseases of the central nervous system cannot be simulated. *b. Pain and Hyperesthesia.*—The most frequent of all complaints. History inconsistent, ordinary traces of suffering absent. Absence of other symptoms usually accompanies types of pain complained of. Absence of objective evidence of localized pains. Note behavior when the registrant believes himself unobserved. *c. Anesthesia.*—Complaint of anesthesia itself creates a suspicion of malingering, as most patients with anesthesia are ignorant of it. *d. Epilepsy.*—Men who have sustained head injury are very apt to claim fits. These complaints may be in reference to grand mal or petit mal. Petit mal attacks are spoken of as fainting attacks. In grand mal attacks there is loss of pupil response to light, knee jerks are lost, and the Babinski reflex may be present. *e. Hysteria.*—Not feigned in itself, but its existence creates confusion as to malingering. The question to be decided is whether the registrant is too seriously affected with the neurosis to be useful as a soldier. *f. Stiff Back.*—Stiff back is a frequent symptom of hysteria in mobilization among selected men. In cases of this kind, organic diseases of the vertebrae can and should be excluded, if necessary, by x-ray examination.

Bed Wetting.—Enuresis, either real or simulated, may be a frequent complaint among registrants for military service, but it is not a cause for unconditional rejection. Bed wetters may be placed in class 1-A or 1-B depending on the apparent significance or severity of the disorder.

General Considerations.—*a.* The surest means of detecting malingering is a thorough understanding by the examining physician of the types of people who actually do it, and the way they behave. It is only in the feigned diseases of the eye and ear that special tests are required. Observation in hospital is necessary in difficult cases. The vast bulk of malingerers are those who exaggerate some actual defect, and the problem for the examining physician is to decide whether the defect complained of is sufficient cause for rejection for service. Persons of intelligence and education have more difficulty in deceiving, as they are bound to express themselves freely. If they are reticent in these matters they arouse suspicion by their reticence. Those who talk freely may be counted on to say things at variance with the existence of the disease of which they complain. *b.* Whenever it shall appear to an examining physician that a registrant is endeavoring to escape service by malingering, if otherwise mentally and physically fit, he will be accepted. A full statement of the facts will be prepared and forwarded to the Director of Selective Service.

NEW YORK MEETING ON MILITARY MEDICINE

The Second District Branch of the Medical Society of the State of New York will hold its thirty-fourth annual meeting at Mitchel Field, Garden City, November 13. The theme of the meeting will be Military Medicine. Among the speakers will be:

Dr. Samuel J. Kopetzky, New York, Plans of the Medical Profession for National Preparedness and Mobilization.

Col. Julius Blank, medical corps, U. S. Army, Second Corps Area, General Principles of Medicomilitary Care and Evacuation.

Dr. Clarence R. Straatsma, New York, Plastic Surgery in Connection with General Medical Work.

Lieut. Col. Martin F. DuFrenne, medical corps, U. S. Army, Fort Jay, Governors Island, Treatment of Head Injuries.

Col. Floyd Kramer, medical corps, U. S. Army, Fort Totten, Flushing, Hospitalization in the Zone of the Interior and in the Theater of Operations.

Dr. Virgil H. Moon, Philadelphia, Practical Phases of the Early Recognition and Management of Shock.

Lieut. Col. Charles L. Maxwell, medical corps, U. S. Army, Mitchel Field, Aviation Medicine.

Addresses will be given by Col. Douglas B. Netherwood, air corps, commanding officer, Mitchel Field, and Dr. James M. Flynn, Rochester, president of the state medical society. A program has also been planned for the local woman's auxiliaries.

Organization Section

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. PAUL C. BARTON:

Nov. 26—Chicago Woman's Aid, Chicago.

DR. W. W. BAUER:

Nov. 6—Yale University School of Medicine, New Haven, Conn.
Nov. 8—New England Superintendents Association, Boston.
Nov. 8—Harvard School of Public Health, Boston.
Nov. 12—Englewood Evening School, Chicago.
Nov. 13—Cleveland Health Museum, Cleveland.
Nov. 18—Boone County Medical Society, Woman's Auxiliary, Jefferson City, Mo.
Nov. 18—Boone County Medical Society, Columbia, Mo.
Nov. 19-20—Stephens College, Columbia, Mo.
Nov. 26—Irving Park Branch, Chicago Medical Society, Woman's Auxiliary, Chicago.
Dec. 6-7—National Education Association, Yearbook Committee, Pittsburgh.

DR. MORRIS FISHBEIN:

Nov. 6—Woman's Auxiliary to North Side Branch Chicago Medical Society, A. M. A. Headquarters.
Nov. 8—Radio Broadcast, National Foundation for Infantile Paralysis, Inc., New York.
Nov. 12—Englewood Branch Chicago Medical Society, Chicago.
Nov. 14—American Conference on Industrial Health, Chicago.
Nov. 24—Joliet Sunday Evening Club, Joliet, Ill.
Dec. 4—Ingham County Tuberculosis Society and Ingham County Medical Society, Lansing, Mich.
Dec. 4—Town Hall, Lansing, Mich.

DR. FRANK H. LAHEY:

Nov. 1—Duke University School of Medicine, Durham, N. C.
Nov. 7—House Officers Association, Boston City Hospital, Boston.
Nov. 7—Brockton Medical Society, Toll House, Whitman, Mass.
Nov. 14—Geneva Academy of Medicine, Geneva, N. Y.
Nov. 18—Massachusetts Hospital Association, Parker House, Boston.

DR. PAUL A. TESCHNER:

Nov. 14—Longfellow School Parent Teacher Association, Oak Park, Ill.
Nov. 19—Roosevelt School Parent Teacher Association, Elmhurst, Ill.
Nov. 25—North Central College, Naperville, Ill.
Dec. 2—Woman's Club, Chilton, Wis.
Dec. 4, 5, 6—Fourth School Broadcast Conference, Chicago.

DR. NATHAN B. VAN ETTEN:

Nov. 13—Southern Medical Association, Louisville, Ky.
Nov. 19—Westchester County Medical Society, White Plains, N. Y.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Examination for Director of Jefferson Hospital.—Applications are now being received to fill the position of director of Jefferson Hospital, Birmingham. An announcement appeared in THE JOURNAL, October 19, page 1385, outlining the qualifications, but a later notice states that the age limit has been eliminated from the requirements, although the applicant must be not less than 32 years of age. The stipulation that previous experience shall have been in a hospital of at least 150 beds has also been eliminated, but the applicant must have had not less than five years' experience as administrator of an approved general hospital caring for both private and charity patients. The closing date for applications has been extended from October 25 to November 10. Information may be secured from the Personnel Board of Jefferson County, Room 520, Courthouse, Birmingham, or from Dr. William H. Walsh, consultant to the board, 612 North Michigan Avenue, Chicago.

CALIFORNIA

Society News.—Dr. Dwight L. Wilbur, San Francisco, addressed the Los Angeles County Medical Association, October 17, on "Clinical Importance of the Vitamin B Complex."——The Los Angeles Society of Neurology and Psychiatry was addressed, October 16, by Drs. Norman Reider on "Influence of Early Training on Later Aphasic Manifestations" and Johannes M. Nielsen, "The Associative Function of the Minor Cerebral Hemisphere."——Among others, Dr. Victor Goodhill discussed "Fracture of the Larynx" before the Los Angeles Society of Ophthalmology and Otolaryngology, October 28.——A symposium on office gynecology was presented before the Alameda County Medical Association, Oakland, October 21, by Drs. Leonard Woods, John N. Ewer, John W. Sherrick and Thomas Floyd Bell, all of Oakland, and Woodburn K. Lamb, Berkeley.

COLORADO

The Friedman Lectures.—The William S. Friedman Lectures will be delivered, November 4-5, under the auspices of the National Jewish Hospital, Denver, in cooperation with the Medical Society of the City and County of Denver and the University of Colorado School of Medicine. The lecturers will be Drs. Edgar Mayer, assistant professor of clinical medicine, Cornell University Medical College, New York, and Oswald S. Lowsley, director, department of urology, James Buchanan Brady Foundation, New York. Dr. Mayer will speak on "Recent Advances in the Clinical Interpretation and Management of Pulmonary Tuberculosis" and "Pulmonary Tuberculosis in the Present Epidemiologic Phase" and Dr. Lowsley on "Surgical and Nonsurgical Treatment of Tuberculosis of the Genital and Urinary Tracts" and "Prostatic Surgery." Both physicians will conduct clinics. The lectures are financed by the Friedman Fund, which was established in 1938.

ILLINOIS

Southern Illinois Meeting.—The sixty-sixth annual meeting of the Southern Illinois Medical Association will be held in the high school gymnasium, Metropolis, November 14. Included among the out of town speakers will be:

Dr. Clyde E. Purcell, Paducah, Ky., Bronchoscopy.
Dr. Russell J. Blattner, St. Louis, Infant Feeding.
Dr. Gershom J. Thompson, Rochester, Minn., Prostatic Problems.
Dr. Adolph H. Conrad, St. Louis, Dermatology in General Practice.
Dr. William T. Pride, Memphis, Tenn., Anesthesia, Analgesia and Amnesia in Obstetrics.
Dr. Samuel B. Grant, St. Louis, Modern Care and Treatment of Pneumonia.
Dr. James S. Speed, Memphis, Tenn., Care of Commoner Fractures Encountered in General Practice.

Postgraduate Conference at Mattoon.—The Illinois State Medical Society is sponsoring a postgraduate course in Mattoon, November 7, with the Coles-Cumberland County Medical Society acting as host. The speakers will be:

Dr. Italo F. Volini, Chicago, Sulfanilamide and Allied Drugs; Indications, Contraindications, Dosage.
Dr. William C. Danforth, Evanston, Ill., Misguided Gynecologic Operations and the Consequences.
Dr. Willard O. Thompson, Chicago, Obesity, Types and Management.
Dr. Millard F. Arbuckle, St. Louis, Late Developments in Upper Respiratory Diseases.
Dr. Louis R. Limarzi, Chicago, Recent Advances and Treatment of Abnormal Blood Conditions.
Dr. Eugene F. Traut, Chicago, Chronic Arthritis, Medical Management.
Dr. John S. Coulter, Chicago, Chronic Arthritis, Management with Physical Therapy.

A symposium on diseases of the biliary tract will be presented in the evening by Drs. Manuel E. Lichtenstein and Karl A. Meyer, both of Chicago.

A conference was conducted in Bloomington, October 31, with the McLean County Medical Society acting as host and with the following speakers on the program:

Dr. James E. Graham, Springfield, Varicose Veins.
Dr. Wilber E. Post, Chicago, Arthritis.
Dr. Bert I. Beverly, Chicago, General Principles of Behavior in Children.
Dr. Henry Close Hesseltine, Chicago, Newer Endocrines in Gynecology.
Dr. Ralph A. Reis, Chicago, Spontaneous Abortions.

A symposium on the gallbladder and liver, with Drs. Andrew C. Ivy and Harry M. Richter, Chicago, as the speakers, concluded the session.

Chicago

Personal.—The Sisters of St. Anthony de Padua Hospital gave a dinner, October 9, in honor of four physicians who have given the hospital more than thirty-five years' continuous service. The physicians are Drs. Stephen E. Donlon and Max A. Weisskopf, who have been members of the staff since its foundation in 1896, and Drs. John D. McGregor and Fred J. E. Ehrmann.

Meeting on Chemotherapy.—Dr. John A. Kolmer, Philadelphia, will address the Chicago Medical Society, November 6, on "The Present Status of Chemotherapy." Discussions of "The Application of Chemotherapy in Medicine" will be presented by Drs. Robert W. Keeton, internal medicine; Warren H. Cole, surgery; Russell D. Herrold, urology; Ralph A. Reis, obstetrics, and Franklin J. Corper, pediatrics.

Society News.—The Chicago Orthopaedic Society was addressed, October 17, by Drs. Francis Walter Carruthers, Little Rock, Ark., on "Treatment of Fractures of Long Bones by a Removable Screw" and James S. Speed, Memphis, Tenn., "Treatment of Fractures Near Joints."——The Chicago Gynecological Society was addressed, October 18, by Drs. John H. Moore, Grand Forks, N. D., on "Late Effects of the Toxemias of Pregnancy" and Edwin C. Hamblen, Durham, N. C., "Observations on the Gynecic Employment of Equine Gonadotropins."——The Chicago Surgical Society was addressed, November 1, by Drs. Stephen A. Zieman on "Fibrosarcoma of the Soft Part of the Finger: Case Report"; Paul B. Magnuson, "Joint Débridement: Surgical Treatment of Certain Types of Arthritis," and Geza de Takats, "Surgical Approach to Hypertension."——Dr. John D. Ellis will discuss "Lesions of the Back Mistaken for Trauma" before the Chicago Society of Industrial Medicine and Surgery, November 4, and Dr. Frederick A. Jostes, St. Louis, "Evaluation of Manipulative Therapy for Back Conditions."——The Chicago Laryngological and Otological Society will be addressed, November 4, by Drs. William E. Grove and Gerhard D. Straus, both of Milwaukee, on "Otitis Media—Meningitis—Labyrinthitis—Recovery with Retention of Function Through Chemotherapy Plus Radical Exposure Without Labyrinthectomy"; John R. Lindsay, "Chemotherapy in the Treatment of Otitic Complications," and Paul A. Campbell, "A Few Medical Problems of Combat Aviation."——The Illinois Psychiatric Society will be addressed, November 7, by Drs. Abraham A. Low and Elizabeth P. MacDougall on "Combined Picrotoxin and Metrazol Treatment of Mental Patients"; Victor E. Gonda, "Treatment of Mental Disorders with Electrically Induced Convulsions," and Gerhart Pisk, Elgin, Ill., "Prognostic Observations in Insulin Treatment of Schizophrenia."

INDIANA

Graduate Course in Obstetrics.—The Tippecanoe County Medical Society, in cooperation with the state bureau of maternal and child health, will offer a postgraduate course in obstetrics at the Home Hospital, Lafayette, beginning November 7. The second meeting will be November 14, the third November 28 and the last December 5.

Dr. Ferree Named Director of Health.—Dr. John W. Ferree, since 1936 chief of the bureau of local health administration, state department of public health, has been appointed director of public health, succeeding Dr. Verne K. Harvey, resigned. Dr. Ferree graduated at Indiana University School

of Medicine, Indianapolis, in 1932. He also has a degree in public health from Johns Hopkins University School of Hygiene and Public Health.

Dr. Huber Wins Obstetricians' Prize. — Dr. Carl P. Huber, associate professor of obstetrics, Indiana University School of Medicine, Indianapolis, has received the 1940 award of the Central Association of Obstetricians and Gynecologists for the best clinical essay. The title of the paper, which was prepared with the assistance of Dr. Jack C. Shrader, 1940 graduate of the medical school and now an intern in the Indianapolis City Hospital, was "Blood Prothrombin Levels in the Newborn." Dr. Huber graduated at the University of Michigan Medical School, Ann Arbor, in 1928, where he served in the department of obstetrics and gynecology until 1936. He spent the following two years at the Chicago Lying-in Hospital and joined the faculty of Indiana University in 1938. Dr. Shrader received the Ravdin gold medal awarded to the student ranking highest scholastically in his class at the June commencement.

MAINE

Society News.—The Androscoggin County Medical Society was addressed, September 19, by Drs. Morris E. Goldman, Lewiston, on "Fractures of the Bones About the Hand" and Edwin Kay, Lewiston, "Placenta Praevia."——Among others, Dr. Duncan E. Reid, Boston, addressed the Kennebec County Medical Association, Gardiner, September 19, on "Use of X-Rays in Obstetrics."——Dr. Frederick T. Hill, Waterville, discussed "Chemotherapy in Relation to Otolaryngology" before the Piscataquis County Medical Association, September 19.

MINNESOTA

Mayo Memorial Proposed.—The Mayo Memorial Commission has been appointed by Gov. Harold E. Stassen to study a proposal for the establishment of a $250,000 fund through public subscription throughout the world for a memorial to the late Drs. William J. and Charles H. Mayo. State Senator William B. Richardson, Rochester, is chairman of the commission, which is composed of seventeen representative citizens of Minnesota.

Society News. — The Minneapolis Clinical Club was addressed, October 10, by Drs. Carl W. Laymon on "Kodachrome Photography in Dermatology"; Harry W. Christianson, "Factitial Proctitis Caused by Irradiation" and "Value of Macroscopic and Microscopic Examination of Excised Rectal and Anal Tissue," and James M. Hayes, "Gastro-Enterostomy" (a motion picture).——Dr. Wesley W. Spink addressed the Minnesota Pathological Society, October 15, in Minneapolis on "Pathogenesis and Treatment of Staphylococcal Infections."——The Wabasha County Medical Society was addressed in Plainview, October 10, by Drs. Earl W. Ellis, Elgin, on "Duties of Physicians in Relation to Medical Preparedness" and "Report of a Case of Ruptured Gastric Ulcer in a Diabetic Patient"; Floyd M. Feldman, Rochester, "Review of Knowledge Concerning Acute Poliomyelitis"; Clarence G. Ochsner, Wabasha, "Report on Appendectomies," and Miland E. Knapp, Minneapolis, "Physical Therapy in General Practice."

NEW JERSEY

New York University Sponsors Courses in Newark.—New York University College of Medicine is offering two postgraduate courses at the Newark City Hospital during 1940-1941. The first, which will begin November 6 and continue through December 4 on Wednesday and Friday afternoons, will be on peripheral vascular diseases. The work will be directed by Dr. Stuart Z. Hawkes, Newark. The second course will be on fractures, under the direction of Dr. Herbert A. Schulte, Newark, and will cover nine weeks, from February 5 to April 2, on Wednesday mornings. Applications should be sent to the Office of the Dean, New York University College of Medicine, 477 First Avenue, New York.

Society News.—Dr. John Carlisle Brown, Atlantic City, addressed the Medical Society of Cape May County at Cape May Court House, October 8, on "Toxemias of Pregnancy."——Dr. William E. Caldwell, New York, addressed the Essex County Medical Society, Newark, October 10, on "Prolonged First Stages of Labor."——Dr. Henry H. Ritter, New York, addressed the Atlantic County Medical Society, Atlantic City, October 18, on "What the General Practitioner Should Know About the Surgery of Trauma."——Dr. Jay Arthur Myers, Minneapolis, addressed the Bergen County Medical Society at Bergen Pines, October 8, on "Follow-Up Work in Tuberculin Testing Surveys."——Dr. Chevalier L. Jackson, Philadelphia, addressed the Camden County Medical Society, Camden, October 1, on "Broncho-Esophagology in Relation to General Medicine."

NEW YORK

District Meetings. — The Fourth District Branch of the Medical Society of the State of New York held its annual meeting in Schenectady, October 1-2, with the following speakers, among others:

Dr. Abraham H. Aaron, Buffalo, Proprietary Medicines.
Dr. John E. Deitrick, New York, Acute Cardiovascular Emergencies.
Dr. Louis H. Bauer, Hempstead, Medical Care of the Indigent Sick.
Dr. Frederick F. McGauley, Schenectady, Treatment of Unusual Fractures.

The Eighth District Branch held its meeting at Niagara Falls, October 3, with the following speakers:

Dr. Noah Stanley Lincoln, Mount Morris, Diagnosis and Management of Early Pulmonary Tuberculosis.
Dr. Julius H. Hess, Chicago, Problems in the Care of the Premature Infant.
Dr. William P. Van Wagenen, Rochester, The Rationale of Common Procedures Used in the Care of Head Injuries.

Dr. Abraham H. Aaron, Buffalo, led a round table discussion on therapy, and there was also a program of motion pictures.

New York City

First Harvey Lecture.—Dr. Charles Armstrong, senior surgeon, U. S. Public Health Service, National Institute of Health, Washington, D. C., delivered the first Harvey Lecture of the season, October 31, at the New York Academy of Medicine. His subject was "Studies on Lymphocytic Choriomeningitis and Poliomyelitis."

Annual Hospital Fund Campaign.—The United Hospital Fund opened its sixty-second annual city-wide campaign, October 21, with a dinner at the Hotel Astor. Roy E. Larsen, president of Time Inc. and publisher of *Life*, is general chairman of the campaign, in which about 5,000 volunteer workers, representing eighty-nine voluntary hospitals, women's social service committees and auxiliaries and the Visiting Nurse Association of Brooklyn will participate.

The Salmon Lectures.—The eighth series of Thomas William Salmon Lectures will be delivered by Dr. Nolan D. C. Lewis, director of the New York State Psychiatric Institute and professor of psychiatry at Columbia University College of Physicians and Surgeons, on three successive Friday evenings at the New York Academy of Medicine. Dr. Lewis's general subject will be "The Pathway of Research in Psychiatry," and the individual lectures will be as follows:

November 8, Historical Perspectives of Psychiatric Thought.
November 15, Modern Ramifications in Psychiatric Thought.
November 22, Prospects for Future Achievement in Psychiatric Research.

Society News. — Drs. Edgar van Nuys Allen, Rochester, Minn., and Loyal Davis, Chicago, addressed a stated meeting of the New York Academy of Medicine, October 3, on medical and surgical aspects, respectively, of "Arterial Hypertension."——Dr. David I. Bassett addressed the Bronx Otolaryngological Society, September 24, on "Otitic Hydrocephalus."——Dr. Harvey B. Matthews, Brooklyn, discussed "Obstetric Shock" in a Friday afternoon lecture of the Medical Society of the County of Queens, October 4.——Dr. William Bierman, among others, addressed the New York Physical Therapy Society, October 9, on "Use of Physically Induced Pyrexia and Chemotherapy in Treatment of Subacute Bacterial Endocarditis."——Dr. Russel H. Patterson addressed the New York Surgical Society, October 9, on "Lymphogranuloma of the Rectum."——Drs. Louis E. Phaneuf, Boston, and Edward A. Schumann, Philadelphia, addressed the Medical Society of the County of Kings, Brooklyn, October 15, on "Cesarean Section" and "Certain Complications in Labor" respectively.

NORTH CAROLINA

Personal. — Dr. Allen J. Jervey Jr., Tryon, has been appointed district health officer for Rutherford and Polk counties to succeed Dr. Harold C. Whims, Rutherfordton, who was recently transferred to the Lincoln-Catawba district.

NORTH DAKOTA

Appointments to State Board.—Drs. Willard A. Wright, Williston, and Archibald D. McCannel, Minot, have been appointed to the state board of medical examiners to succeed Drs. William C. Fawcett, Starkweather, and Jesse W. Bowen, Dickinson. Dr. William A. Gerrish, Jamestown, was reappointed.

OHIO

Annual Institute on Cardiovascular Disease. — The Academy of Medicine of Cincinnati and the Heart Council of Cincinnati will present the seventh Cardiovascular Institute, November 12, on "Congestive Heart Failure." Clinical programs will be held at the Cincinnati General Hospital and the Children's Convalescent Home, the annual dinner of the Heart Council at the University Club and an evening meeting at the Academy of Medicine, with Dr. Tinsley R. Harrison, Nashville, Tenn., as the guest speaker.

Postgraduate Program. — The Summit County Medical Society presented its ninth annual Postgraduate Day, October 23, in Akron. The speakers, all of the faculty of the University of Michigan Medical School, Ann Arbor, were:

Dr. Cyrus C. Sturgis, The Menace of Obesity, and The Diagnosis and Treatment of the So-Called Secondary Anemias.
Dr. John Alexander, Intrathoracic Tumors, and the Management of Bronchiectasis.
Dr. Walter G. Maddock, Problems in Severe Hyperthyroidism.
Dr. John M. Sheldon, Evaluation of Modern Drugs in Management of Allergic Patients, and the Diagnosis and Management of Eczema Patients.

PENNSYLVANIA

Warning of Impostor.—A man purporting to represent a firm called Hogan & Hogan at Germantown has been traveling through Pennsylvania taking orders for physicians' supplies, such as gauze, bandages and adhesive. Investigation by the Post Office at Germantown revealed that there is no such firm in the town, a Pennsylvania physician reports.

Memorial to Dr. Jesse Lazear.—Washington and Jefferson College, Washington, dedicated a new $100,000 chemistry building, October 26, to the memory of Dr. Jesse W. Lazear, who died in Cuba in 1900 of yellow fever while serving as a member of the Yellow Fever Commission of the U. S. Army. Dr. Lazear was an alumnus of the college. John R. Kissinger, Huntington, Ind., and John J. Moran, Habana, Cuba, two of the group of soldiers who allowed themselves to be bitten by mosquitoes during the investigation, were guests at the dedication ceremonies. The college drama club presented Sidney Howard's play "Yellow Jack" as part of the ceremonies, which were held on the college's Founders' Day. At a banquet in the evening Dr. Philip S. Hench, Rochester, Minn., made an address on the work of the Yellow Fever Commission. The Jesse W. Lazear Chemistry Hall is one of three buildings dedicated, including one in honor of Edwin Linton, Ph.D., for many years professor of biology and geology at Washington and Jefferson and one of the founders of the Marine Biological Laboratory at Woods Hole, Mass.

Philadelphia

Annual Dinner of Ex-Residents.—The fifty-fourth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held Tuesday, December 3, at the Midday Club, with Major Gen. Charles R. Reynolds, retired, director of the division of tuberculosis in the state department of health, as the guest of honor. Ex-residents who do not receive notices are requested to send their correct addresses to the secretary, Dr. George S. Wilson, 133 South Thirty-Sixth Street, Philadelphia.

Society News.—Dr. Joseph Stokes Jr. addressed the Philadelphia Pediatric Society, October 8, on "Clinical and Nutritional Problems Arising in Unoccupied France." Dr. Stokes recently spent several weeks in the area.——Drs. William T. Read Jr., Camden, N. J., and Leonard P. Lang, among others, addressed the Pathological Society of Philadelphia, October 10, on "Acutely Progressive Hodgkin's Disease" and "Tuberculosis of the Adrenal Simulating Thyroid Crisis" respectively.——Speakers before the Philadelphia Psychiatric Society, October 11, included Drs. Matthew T. Moore, Nathaniel W. Winkelman and Leon Solis-Cohen on "Asymptomatic Vertebral Fractures in Epilepsy."

RHODE ISLAND

Annual Clinic at Pawtucket.—The annual Intern Alumni Clinic Day will be held at Memorial Hospital, Pawtucket, November 6. Members of the staff will conduct clinics and the following members of the staff of Memorial Hospital for the Study of Cancer and Allied Diseases, New York, will give addresses: Drs. Hayes E. Martin on "Diagnosis and Treatment of Cancer of the Head and Neck"; Norman Treves, "Diagnosis and Treatment of Cancer of the Breast," and George T. Pack, "Diagnosis and Treatment of Cancer of the Gastrointestinal Tract."

WASHINGTON

State Obstetric Meeting.—Dr. Howard C. Stearns, Portland, Ore., was the guest speaker at the fall meeting of the Washington State Obstetrical Association at Spokane, October 5. At the morning session there were panel discussions of obstetric hemorrhage and in the afternoon reports of unusual cases were presented. Dr. Stearns conducted a round table discussion of antepartum care and presented two addresses on "Abruptio Placentae and Placenta Praevia" and "Prevention of Gynecologic Pathology."

Society News.—Drs. Kenneth K. Sherwood and Sylvester N. Berens, Seattle, addressed the Pierce County Medical Society, Tacoma, October 8, on "Arthritis and Focal Infection" and "The Intervertebral Disk" respectively.——Speakers before the King County Medical Society, Seattle, October 21, were Drs. Kenneth K. Sherwood, on "Medical Aspects of Postoperative Complications"; Joseph Gordon Spendlove, "Postoperative Complications of Anesthesia," and Edwin A. Nixon, "Postoperative Complications of Surgery."——Drs. Milburn H. Querna and Joseph W. Lynch addressed the Spokane County Medical Society, Spokane, October 10, on "Mechanics of Respiratory Function, Clinical Applications" and "Headache, Mechanism and Treatment" respectively.——Dr. Homer D. Dudley, Seattle, addressed the Walla Walla Valley Medical Society, Walla Walla, October 10, on "Acute Infections of the Hand."

GENERAL

"Nervous Insomnia" and Bad Checks.—A physician in Des Moines, Iowa, reports that a bad check swindler has again been imposing on the medical profession. A man in his early thirties, well groomed and intelligent, has been calling on physicians to get a prescription for "nervous insomnia." He claims to be a district sales manager for a large company just being transferred to the territory. The physician in his previous locality, he states, advised two prescriptions, one of phenobarbital for a daily sedative and one of seconal or nembutal if all else fails. He then asks where to take the prescription, cashing a small check at the drugstore on a local bank. The man is said to be a former student of osteopathy in Des Moines who was discharged for theft. In warning physicians, the Iowa physician calls attention to a peculiarity of rotation of the left eye.

American Society of Tropical Medicine.—The thirty-sixth annual meeting of the American Society of Tropical Medicine will be held in Louisville, Ky., November 12-15, in conjunction with the American Academy of Tropical Medicine and the National Malaria Committee during the annual session of the Southern Medical Association. The Walter Reed Medal will be awarded to Dr. Herbert C. Clark, Gorgas Memorial Institute of Tropical and Preventive Medicine, Inc., Panama, C. Z., and the fifth Charles Franklin Craig Lecture will be delivered by Dr. Rolla E. Dyer, U. S. Public Health Service, Washington, D. C., on "The Control of Typhus Fever." Among other speakers will be:

Drs. Clarence A. Mills and Joseph W. Colvin, Cincinnati, Thiamine Protection Against the Depressive Effects of Tropical Heat.
John F. Kessel, Ph.D., Los Angeles, Recent Advances in the Study of Coccidioides in Infection.
Dr. Henry E. Meleney and Thomas L. Snyder, Ph.D., Nashville, Tenn., The Excystation of Endamoeba Histolytica in Bacteriologically Sterile Media.
Carl M. Johnson, Sc.D., Ancon, C. Z., Naturally Acquired Infections of Endamoeba Histolytica in Rhesus and Ateles Monkeys.
Ralph R. Parker, Ph.D., U. S. Public Health Service, Hamilton, Mont., Rocky Mountain Spotted Fever.
Drs. Harry Most and Milton Helpern, New York, Trichinosis in New York.

Dr. Louis L. Williams Jr., U. S. Public Health Service, will deliver his presidential address at the annual luncheon Wednesday on "Malaria Along the Burma Road." The Academy of Tropical Medicine will have its seventh annual dinner Thursday evening at the Hotel Seelbach, at which Dr. Charles S. Butler, U. S. Navy, retired, will give his presidential address on "Some Contributions of United States Naval Medical Officers to Science." The National Malaria Committee will hold its meeting Friday at the Seelbach under the chairmanship of W. G. Stromquist, health and safety department, Tennessee Valley Authority, Chattanooga, Tenn.

CORRECTION

Tattooing for Pruritus Ani.—In THE JOURNAL, October 12, page 1309, in the abstract of Turell's article the word "not" was omitted in the sentence beginning "Tattooing with mercuric sulfide is not done . . ."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 14, 1940 (delayed).

The Treatment of Wound Shock

The Committee on Traumatic Shock and Blood Transfusion, appointed by the Medical Research Council, under the chairmanship of Prof. A. N. Drury, F.R.S., has presented a report on the treatment of wound shock. As the committee consists of the leading physiologists, biochemists, pathologists, physicians and surgeons of the day, the report is for the time the last word on the subject. Primary shock, which follows soon after injury and is not due to hemorrhage, resembles fainting. It responds to simple measures. The report deals at length only with secondary or wound shock, which develops insidiously some hours after injury. It is characterized by weakness, pallor and raised pulse rate and, in advanced cases, by lowered body temperature, sweating, low blood pressure, rapid thready pulse, vomiting and intense thirst. Medical officers should train themselves to recognize wound shock in its earliest stages, for it is then that treatment is likely to be effective. Wound shock closely resembles hemorrhage clinically and is likewise circulatory failure due to diminished blood volume, but loss of blood and plasma into the tissues produces the latter. Shock results from many factors besides loss of blood—fatigue, dehydration, pain and exposure to cold and wet—all of which demand attention in treatment. In some cases no more is necessary, but in the majority active steps to restore blood volume must be taken as early as possible. Reduction of blood volume is the constant and important feature and on its treatment success depends.

During military operations the most that can be done in advanced positions is to limit hemorrhage and loss of plasma by a firm bandage or tourniquet and by splinting to prevent pain and local loss of plasma due to movement of a fractured limb during transportation. The wounded must be protected from cold, and it is of great importance to give water freely and repeatedly except to those who are unconscious or have abdominal wounds. It should preferably contain 1 teaspoon of salt to the pint. The army transfusion apparatus allows blood or plasma to be administered at least as far forward as main dressing stations. Open wounds of the chest should be closed immediately, as otherwise they have a high mortality.

A patient unfit by reason of shock for immediate operation should be put in a resuscitation ward, where greater rest and quiet can be ensured than in a busy general ward. Wet and dirty clothes must be cut off with as little disturbance as possible and the patient should be clothed in warm pajamas and the bed warmed. For the relief of pain morphine from one-fourth to one-half grain (0.016 to 0.032 Gm.) subcutaneously is of exceptional value. When the circulation is too slow for quick absorption an almost immediate effect can be obtained by intravenous injection of up to one-fourth grain. The most valuable single method for combating shock is blood transfusion. Whole blood is of proved value, but human plasma or serum, because of their superior keeping qualities, are more convenient under field conditions. In extensive burns, in which reduction of blood volume is due entirely to loss of plasma, replacement by plasma or serum is theoretically correct. Even in hemorrhage, serum proteins and an adequate blood pressure may be of greater value than an increase of oxygen-carrying power. When blood, plasma or serum is not available, isotonic saline or dextrose solution may be used, but the restoration of blood volume is only transient by intravenous infusion of these solutions and is not devoid of risk. Because of the dehydration, repeated and copious drinking of fluids should be encouraged, with the exceptions mentioned. If necessary, the rectal route may be used. Oxygen should be given to all who manifest cyanosis of the lips, ears or nails. It is especially necessary in any interference with respiration, as in chest wounds. In cases of infected wounds, absorption of toxins aggravates shock. Infected tissue must therefore be promptly removed and chemotherapy and other forms of treatment given. For cases requiring anesthesia, gas and oxygen, combined with ether, if necessary, is the mixture of choice, provided a skilled anesthetist and apparatus are available; otherwise ether alone should be used. Chloroform or spinal anesthesia should not be employed. The administration of an anesthetic to a shocked patient requires special care.

The Protection of Glass in Hospitals

Air raids have given rise to many problems in connection with the security of hospitals. The Research and Experiments Branch of the Ministry of Home Security has issued a memorandum on the protection of glass in hospitals. Three ways are suggested to minimize the scattering of glass from windows: (1) by covering the windows with wire netting of half inch or smaller mesh fixed to detachable frames, (2) by covering them inside with light weight screens which will cause the broken glass to fall close to the window and (3) by covering the glass with "anti-scatter material." The last can be done in four ways, which, in the order of effectiveness, are as follows: (*a*) Strong textile netting or some other fabric is stuck firmly to the glass. This is best applied with a preparation insoluble in water as varnish or lacquer. Thick and tough paper may be applied; crisscross strips are not recommended. (*b*) Cellulose film with varnish or lacquer as a waterproof coat is used. (*c*) Strips of material not less than 1½ inches wide and spaced to give not more than 6 inches of clear glass between the strips are used. (*d*) Liquid coatings, such as rubber latex, are applied but are not effective for panes more than 4 square feet.

It is recommended that all glass in operating rooms, except that in utensils and suspended light fittings, be removed. Window openings should be completely bricked up or barricaded and any roof-light opening would be covered by concrete slabs, sandbags or timber. If this is done and the operation light is a single freely suspended unit, fracture of the glass is not likely.

Medical War Relief Fund

As the benevolent funds of the medical profession are hard put to provide for ordinary cases of hardship, a special fund has been established for the temporary assistance of physicians and their dependents who are in financial straits from war conditions. For the organization of this fund a committee has been formed consisting of officers of the British Medical Association, the presidents of the Royal Colleges of Physicians, Surgeons and Obstetricians and Gynecologists, the chairman of the Charities Committee of the British Medical Association and the president of the Royal Medical Benevolent Fund. The sum of $13,500 has been collected in a short time. As the medical profession has suffered less than other professions from the disturbances of the war, it is thought that it should itself come to the assistance of its own members.

Marriages

HARRY D. FEINBERG, Long Branch, N. J., to Miss Minna Liebesman of Asbury Park, June 28.

BLANCHARD FRED FORD JR., Clover, S. C., to Miss Marjorie Nelle Wells at Bennettsville, July 6.

WILLIAM J. EGAN, Boston, to Miss Mary J. Sullivan of Newton Highlands, Mass., July 10.

SAMUEL ARTHUR PURVES, Des Plaines, Ill., to Miss Rae McKnight of Boston, July 13.

WILLIAM COHEN, Portland, Ore., to DR. STELLA FISHER of New York, June 30.

Deaths

Charles Nicoll Bancker Camac, Altadena, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; instructor of physiology at his alma mater in 1895; instructor of physical diagnosis, chief of medical clinic, lecturer in medicine from 1905 to 1909 and professor of clinical medicine, 1909-1910, at the Cornell University Medical College, New York; assistant professor of clinical medicine at Columbia University College of Physicians and Surgeons, New York, from 1910 to 1938; emeritus professor of internal medicine at the New York Polyclinic Medical School and Hospital; visiting physician from 1899 to 1916 and consulting physician from 1916 to 1935 at the New York City Hospital; served during the World War; member of the Association of American Physicians; director of medicine, Gouverneur Hospital of Bellevue and Allied Hospitals, New York, from 1916 to 1923; author of "Imhotep to Harvey: Backgrounds of Medical History"; aged 72; died, September 27.

Joseph Patrick Brennan, Buffalo; University of Buffalo School of Medicine, 1908; member of the Medical Society of the State of New York; served during the World War; past president of the Buffalo Academy of Medicine; on the staffs of the Emergency Hospital of the Sisters of Charity, St. Mary's Infant Asylum and Maternity Hospital and the Millard Fillmore Hospital; aged 56; died, September 28, of coronary thrombosis.

Philip Eugene Garrison ✠ Surgeon Lieutenant Commander, U. S. Navy, retired, Ridgewood, N. J.; George Washington University School of Medicine, Washington, D. C., 1906; entered the navy in 1906 and retired in 1933 for incapacity resulting from an incident of service; aged 62; died, September 22, in the United States Naval Hospital, Brooklyn, of carcinoma of the liver and acute nephritis.

Thomas Lafayette Walker Bailey, Clinton, S. C.; Medical Department of Grant University, Chattanooga, Tenn., 1893; member of the South Carolina Medical Association; for many years trustee of the local schools; past president of the Laurens County Medical Society; aged 70; died, September 29, in the South Carolina Sanatorium, State Park, of pulmonary tuberculosis and cerebral hemorrhage.

John Clarence Smith, Jackson, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1907; member of the Michigan State Medical Society; past president of the Jackson County Medical Society; member of the board of managers and on the staff of the W. A. Foote Memorial Hospital; on the staff of the Mercy Hospital; aged 58; died, September 3, of coronary disease.

Wilson Kirt Dyer ✠ El Reno, Okla.; Eclectic Medical Institute, Cincinnati, 1908; member of the Illinois State Medical Society and the American Psychiatric Association; chief medical officer of the Federal Reformatory; formerly on the staffs of the East Moline (Ill.) State Hospital and the Peoria (Ill.) State Hospital; aged 55; died, September 20, of coronary thrombosis.

Joseph Lawrence Adams, Asheville, N. C.; Jefferson Medical College of Philadelphia, 1910; member of the Medical Society of the State of North Carolina; served during the World War; on the staff of the Asheville Mission Hospital and the Aston Park Hospital; aged 55; died, September 27, of intestinal hemorrhage and hypertensive heart disease.

Frederic Almon Thayer ✠ Beloit, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; past president of the Rock County Medical Society; on the staff of the Beloit Municipal Hospital; aged 68; died, September 5, of coronary embolism.

Clement Dunham Smith ✠ Dayton, Ohio; Medical College of Ohio, Cincinnati, 1901; past president of the Montgomery County Medical Society; for many years on the staff of St. Elizabeth's Hospital; aged 62; died, September 4, in the Miami Valley Hospital of cerebral hemorrhage.

Louis Austin Bolling, Otterbein, Ind.; St. Louis College of Physicians and Surgeons, 1897; member of the Indiana State Medical Association; served during the World War; formerly on the staff of the Epworth Hospital, South Bend; aged 73; died, September 10, of heart disease.

Vern Leonard Hamilton, Pendleton, Ore.; Willamette University Medical Department, Salem, 1913; member of the Oregon State Medical Society; aged 57; died, September 13, of injuries received when he was struck by an automobile.

Harold Rowland Whiteside, Redding, Calif.; University of Oregon Medical School, Portland, 1933; member of the California Medical Association; aged 36; died in September at Sacramento of anterior poliomyelitis, bulbar type.

Charles Wallington Alden, Saginaw, Mich.; Bellevue Hospital Medical College, New York, 1877; formerly president of the city board of health, health officer and county coroner; aged 82; died, September 12, of a fractured hip.

Phillip Francis Hickey ✠ Smethport, Pa.; St. Louis University School of Medicine, 1933; aged 31; on the staff of the Kane (Pa.) Community Hospital, where he died, September 19, of injuries received in an automobile accident.

Wallace Ray Swartzwelder, York, Pa.; University of Maryland School of Medicine, Baltimore, 1927; member of the Medical Society of the State of Pennsylvania; aged 40; died in September of a self-inflicted bullet wound.

John O. Handley, Sycamore, Ala.; Memphis (Tenn.) Hospital Medical College, 1904; member of the Medical Association of the State of Alabama; died in September at the Citizens' Hospital, Talladega, of a gunshot wound.

Francis Johnston Sloane, Princeton, N. J.; Columbia University College of Physicians and Surgeons, New York, 1908; aged 56; was killed, September 5, near Mexico City, Mexico, in an automobile accident.

Perkins Glover, Arvonia, Va.; Medical College of Virginia, Richmond, 1901; member of the Medical Society of Virginia; member of the county board of health; aged 66; died, September 5, of coronary thrombosis.

Homer H. Gates, Franklin, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1899; member of the Louisiana State Medical Society; aged 64; died, September 27, of angina pectoris.

Albert Sidney Jarvis, Troup, Texas; University of Louisville (Ky.) Medical Department, 1894; at one time postmaster; formerly bank president; aged 72; died, September 7, of coronary occlusion.

Hiram D. Vaughter, Byers, Texas; Memphis (Tenn.) Hospital Medical College, 1903; member of the State Medical Association of Texas; aged 73; died, September 10, of cerebral hemorrhage.

Lawson Silas Henley, Huntington, W. Va.; University of Louisville (Ky.) Medical Department, 1905; member of the West Virginia State Medical Association; aged 67; died, September 16.

Max Dobrow, Chicago Heights, Ill.; Jenner Medical College, Chicago, 1917; for many years city police physician; aged 56; died, September 20, in St. James Hospital of appendicitis.

Nicholas Matthew Crofts ✠ North Adams, Mass.; Baltimore Medical College, 1898; served during the World War; aged 74; died, September 17, of coronary thrombosis.

George Frederic Cullens, New Albany, Miss.; Memphis (Tenn.) Hospital Medical College, 1892; aged 69; died, September 15, of aortic regurgitation and myocarditis.

Harvey T. Wickert, Emmaus, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; aged 85; died, September 11, of cerebral hemorrhage.

Jeremiah W. Trueblood, Monroe City, Ind.; Hospital College of Medicine, Louisville, Ky., 1891; aged 88; died, September 6, of uremia and chronic nephritis.

Melissa Evelyn Thompson Coppin, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1910; aged 62; died, September 27, of acute endocarditis.

Julia Helen Bass, San Antonio, Texas (licensed in Texas by years of practice); aged 82; died, September 25, of acute pyelocystitis, uremia and arteriosclerosis.

Henry G. Brueckbauer, Sheboygan, Wis.; Homeopathic Medical College of Missouri, St. Louis, 1904; aged 62; died, September 16, of coronary thrombosis.

Louis Woodruff Armstrong ✠ Danville, Ind.; University of Maryland School of Medicine, Baltimore, 1900; aged 64; died, September 19, of angina pectoris.

Thomas Clifford Burnes, Randolph, Vt.; University of Vermont College of Medicine, Burlington, 1937; aged 27; died, September 9, of cerebral hemorrhage.

George Temple Beckett, Arlington, Ind.; University of Indianapolis Medical Department, 1899; aged 68; died, September 28, of coronary thrombosis.

David Marion Higgins ✠ Gainesville, Texas; Hospital College of Medicine, Louisville, Ky., 1893; aged 72; died, September 16, of coronary thrombosis.

Bureau of Investigation

FONG WAN, THE CHINESE HERBALIST

Herbert Corey, in *Nation's Business* for September 1940, under the heading "Washington and Your Business," submits the following item:

"Ever since the introduction of the Logan-Walter bill for the bridling and saddling of the government bureaus interest in their oddities has been growing. Here's a sample:

"The Post Office Department barred a Chinese doctor from the mails. He went to court, alleging that the drugs he used had been in the Chinese materia medica for 2,000 years, and produced many witnesses who testified that the Chinese drugs had cured them. The verdict of the court was in his favor.

"The Post Office still bars him from the mails."

Obviously Corey means to imply by this that since the Chinese "doctor" was found not guilty in court, the order barring him from the mails should no longer be in force and that in some unspecified way the Post Office Department is acting in disregard to the considered judgment of a court of record. While THE JOURNAL holds no brief for the pronounced extension of administrative agencies and their powers, the item quoted above seems to be unjust to the Post Office Department.

This Bureau cannot be positive as to which case Corey is referring to, but the case of one Fong Wan does meet the facts referred to by Corey. This is not the first time that Fong Wan has had the attention of this Bureau. As a matter of fact, THE JOURNAL for June 6, 1931, contained an article concerning him and a fraud order which was issued the previous year and which is still in effect.

This fraud order was issued in accordance with what has often been referred to as the Fraud Order Law (U. S. Code, Title 39, Sec. 259), which reads in part as follows:

"The Postmaster General may, upon evidence satisfactory to him that . . . any person or company is conducting any scheme or device for obtaining money or property of any kind through the mails by means of false and fraudulent pretenses, representations, or promises, instruct postmasters at any post office at which registered letters or any other letters or mail matter arrive directed to any such person or company . . . to return all such mail matter to the postmaster at the office at which it was originally mailed, with the word 'Fraudulent' plainly written or stamped upon the outside thereof; and all such mail matter so returned to such postmasters shall be by them returned to the writers thereof, under such regulations as the Postmaster General may prescribe.

The statute is not *penal*, it is not a *criminal* statute. It simply authorizes the Postmaster General to protect the public from palpable frauds coming to his attention. Any person to whom the mails have been so closed presumably has adequate *civil* remedies, if he considers himself aggrieved, to compel the use of the mails.

Some time later Fong Wan was indicted under the Federal Criminal Laws for using the mails to defraud. He did not go to court as might be inferred from Corey's item to question the fraud order and to ask the courts to require the Post Office to let him use the mails, but because he was accused of violating U. S. Code, Title 18, Sec. 338, the material part of which reads:

"Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations or promises . . . shall, for the purpose of executing such scheme or artifice or attempting so to do, place, or cause to be placed, any letter, postal card, package, writing, circular, pamphlet, or advertisement, in any post office, or station thereof, or street or other letter box of the United States, or authorized depository for mail matter, to be sent or delivered by the Post Office Establishment of the United States, shall be fined not more than $1,000, or imprisoned not more than 5 years, or both."

The intent of the authorities was to see that he was punished criminally for his acts. *He was not convicted.* But this has absolutely no relation to the fraud order. This may be illustrated by noting that the acquittal of a physician on a *criminal* charge of abortion will not prevent the appropriate licensing agency from revoking his license to practice for performing an *illegal* abortion.

Now let us see just what Fong Wan has done to warrant the issuance and continuance of the fraud order.

The evidence indicates that Fong Wan, who, so far as THE JOURNAL knows, has never been licensed to practice any form of the healing art in any state in the Union, has offered treatments for practically every disease under the sun. For example, one of his remedies is offered for diabetes and he was promoting it as a cure in 1930. If it really did cure, every diabetic person in California would be availing himself of the opportunity of taking it by this time. Thus there should be no more deaths from diabetes in California.

Wan has promoted his products on the basis of the teachings of a former Chinese emperor known as Shin Nong, which, he says, means "Divine Farmer." According to some of the publicity of the Fong Wan Herb Company of Oakland:

"He [Shin Nong] believed that all things on earth were included in five natural elements: water, fire, vegetation, mineral and earth. The color predominating in the vegetation element is green. Because the liquid contained in the gall bladder and the juices secreted by the liver are greenish, he concluded that the gall bladder and liver belonged to the vegetation element. The natural color of the fire element is red. As the heart controls the circulation of the blood of the body, and as the blood is red, he said that the heart belonged to the fire element. The natural taste of the water element is salty. As the urine, which passes through the kidneys into the bladder, is salty, these two organs were classified under the water element. The natural color of the earth element is yellow. As Shin Nong believed that the stomach gets its power from the spleen, and as the gastric juice of the stomach is yellow, he classified the spleen and the stomach as belonging to the earth element. As the color of the natural element in mineral is white, and as the lungs are white, he concluded that they belonged to the mineral element."

On Dec. 14, 1939, the Federal Trade Commission at Washington issued a complaint against Fong Wan, charging him with misrepresentation in advertising matter, in newspapers and periodicals and in a booklet designated "Herb Lore" (from which the foregoing quotation concerning Shin Nong was taken) concerning the remedial benefits of Chinese herbs sold and distributed by Fong Wan and his co-partners. The complaint charged that in advertising matter the respondents represented that the herbs sold by them "'are a remedy, cure and effective treatment for heart trouble, high blood pressure, colds, influenza, asthma, pyorrhea, blood disorders, cross eyes and other eye troubles, cancer, stomach troubles, dysentery, pains, dizziness, hardening of the arteries, goiter, bronchial trouble, coughs, sinus trouble, liver and gallbladder troubles, diabetes and other disorders of the kidneys and bladder, nervous attacks and disorders, arthritis, obesity, headaches, neuritis and piles, and that they stop pain and give permanent relief from asthma and other disorders."

The complaint alleged that "in truth and in fact the respondents' Chinese herbs are not a remedy or cure for any of the ailments or diseases named; that they do not and cannot wash away any diseases from the human body; that Fong Poy or Fong Wan is not able to diagnose or heal diseases or ailments, nor has he restored the health of any persons by the use of Chinese herbs."

The outcome of this case is, of course, not known at the present time. It is interesting to note, however, that on February 26 of this year Fong Wan issued a fourteen page advertisement in the Oakland *Tribune*, reproducing some of the testimony that had been transcribed at the Federal Trade Commission hearing in connection with the complaint noted. It has been reported to us that Fong Wan paid $4,850 for the printing of this advertisement, which comprised a section of the Oakland *Tribune*. The heading of this advertisement was "Marvelous Results Derived From Fong Wan Chinese Herbs Have Been Testified Before the Federal Trade Commission at San Francisco, California," and the subheading read "Numerous Witnesses at Commission Hearing Tell of Instances Where They Were Relieved by Use of Chinese Herbs. Following is Copy of Official Transcript of Testimony in Fong Wan Hearing." On the final page of this section of the Oakland *Tribune* there appeared some excerpts from the booklet "Herb Lore," and under the heading "Unparalleled Success of Fong Wan, Herbalist" it is stated that since the establishment of his herb business in Oakland in 1915 he has won more than twenty cases in the police court. Again quoting from the advertisement:

"In 1924-1925, some lawyers and Chinese women combined to sue him for $25,000 in a slander suit (that had been predicted in his horoscope at the time of his birth). He won this case in both the Appellate and the State Supreme Courts. This suit cost the plaintiffs at least $3,000."

He claimed further that "In 1925 the Anti-Herb Bill was introduced. An investigation by the State Assembly at Sacra-

mento was started. It cost the State of California no less than $6,000 (and showed many indications that it was a bill of graft)."

Finally, it is claimed that "For more than 20 years Fong Wan has realized that the medicos, after having failed in their attempts to put the chiropractors and healers of other schools out of business, would center their attention on the Chinese herbalists. Being the most renowned herbalist in America, Fong Wan also suspected that he would be the target."

If one may judge by the transcript of the Federal Trade Commission hearing which is detailed in his advertisement, the principal defense of this herbalist is the testimony of individuals who claim to have been cured, and, incidentally, individuals who have submitted testimonals which are used in advertising the products. The fact that these individuals are not qualified either to diagnose their own condition or to determine whether or not they have been cured of that condition indicates that the evidence for the usefulness of his preparations is far from scientific.

A few excerpts from the booklet "Herb Lore" will serve to illustrate the type of hokum which it contains:

"It is customary in America for people to have electric toasters on their table and to make lots of toast. Even sick persons in the hospitals are frequentlly served hot toast without regard to their ailments. Most people never stop to think that toast takes in the direct fire heat, and that the butter, which is fat-giving, adds more heat to the body. A little toast occasionally does no harm, but if a person eats hot buttered toast every day, some of the following ailments will appear sooner or later: headache, tiredness of the eyes, sinus inflammation, stomach ulcers, cold sores, canker sores, etc. If one wishes to avoid overheating the system, it is best to eat steamed or boiled food."

We also find:

"In the United States of America, due mainly to the persistency of the Chinese herbalists themselves and their willingness to endure persecution for the sake of their profession, the use of Chinese Herbal Remedies has been gradually introduced. At the present time, scientists are keenly interested in Chinese Herbs. The chemists of the University of California and of other universities in the United States are making intensive studies and carrying on numerous experiments in order to determine scientifically the exact effects of certain Chinese Herbs upon the human system."

Such a statement as the final one in the preceding paragraph would indicate that the promoter has little concern as to whether or not scientific experimentation will demonstrate just how ineffective these remedies will be found to be. Elsewhere in the booklet Fong Wan expresses the belief that the scientists will have trouble determining the efficacy of the remedies:

"Extracts of various Chinese herbal remedies have been subjected to chemical processes in order to precipitate their elements. However, many kinds of herbs and roots show nothing in the test tube; consequently, the chemists cannot determine their uses. For example, a chemist is never able to discover the elements of the Ginseng Root which is a wonderful remedy in building up the air circulation in the body. For the past fifty centuries, the Chinese have used Ginseng Root to strengthen the air circulation and have combined it with other herbal remedies to improve the blood circulation.

"Articles written by chemists or pharmacists frequently appear in the newspapers ridiculing the Chinese as being superstitious in believing that Ginseng has great medicinal value. Because these writers cannot see the curling of the smoke, they say there is no fire."

In case the reader might think that some herbs were drugs or vice versa, the following statement is made:

"Naturally, when we look at the words 'drug' and 'herb,' we think of them as being related. Each consists of four letters. There, however, the resemblance ends."

On the basis of such statements, the reader is introduced to herb lore. The remainder of the booklet is made up of chapters concerning the various organs of the human body, for example the stomach, the spleen, the heart, the lungs and the throat. Each chapter opens with the Chinese theory regarding the subject and closes with testimonials of those who claim to have suffered from diseases affecting those organs and to have obtained relief from the use of Fong Wan's remedies. His testimonial writers claim cures for everything under the sun. One individual, Gregory G. Souza of Oakland, Calif., stated that he had a very sore throat which the doctor pronounced a case of diphtheria. But, remembering that Fong Wan had rid his sister of a long-standing cough which the doctors had called consumption, and restored his cousin, who suffered from dropsy, to perfect health, he decided to try him. Within two hours after taking Fong Wan's remedy, all the pain in his throat was gone and the swelling had subsided. As an afterthought, Souza added: "Recently I suffered from Cancer of the Navel and the pain became so severe that I was confined to my bed for three weeks. Again I had recourse to Fong Wan, and I am happy to say that the cancer has now entirely disappeared and I am well and strong."

Mrs. Emma Kennedy of Vallejo, Calif., wrote as follows:

"To Whom It May Concern:

I suffered from Diabetes, Heart Trouble and Nerves for some time. It seemed as though no relief could be had anywhere. Two months ago, however, I began to drink Fong Wan Herbs and I soon realized their healing power. I am happy to testify that my troubles have been entirely overcome and that I now feel like a new woman. I am writing these few lines in order that others so afflicted may know where to find relief."

Citizens of the United States should be exceedingly proud that federal laws permit a fraud order to remain in force against an individual who is obviously engaged in fraudulent practices, even though he has been able to obtain a verdict of not guilty in a case in the courts under what is referred to as the Fraud Law. The postal authorities are to be commended for continuing the fraud order and thus interfering to some extent with the activities of this individual. Sooner or later the state authorities of California may enter the picture. In the meantime, it will be interesting to note the outcome of the Federal Trade Commission case.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J., cosmetics C. N. J., and foods F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bad-Ex-Salts.—American Laboratories, Carlisle, Pa., and E. J. Barry, Inc., New York. Composition included tartar emetic. Laxative and tonic. Dangerous to health when used as directed.—[*D. D. N. J., F. D. C. 44; May 1940.*]

Bromo-Seltzer.—Emerson Drug Co., Baltimore. Composition: an effervescing mixture of acetanilid, sodium bromide and caffeine. For headache, neuralgia and disordered stomach and nerves. Dangerous to health when used as directed.—[*D. D. N. J., F. D. C. 81; May 1940.*]

Cal-co-cin.—Crescent-Kelvan Co., Philadelphia. Composition: calcium salts of benzoic acid and cinchophen. For arthritis. Declared potentially injurious if used as directed.—[*D. D. N. J., F. D. C. 10 and 77; May 1940.*]

Cephalgine Tablets.—Cephalgine Co., Spencer, Mass. Composition: acetanilid, caffeine and camphor. For simple headaches, neuralgia and muscular pains. Dangerous to health when used as recommended.—[*D. D. N. J., F. D. C. 80; May 1940.*]

Guerlain Lipsticks (Nos. 144, 145 and 160.).—Guerlain, Inc., New York. Composition included cadmium and selenium. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 16; May 1940.*]

Hydeeoyl.—Murray Oil Products Company and Industrial Oil Products Corporation, Los Angeles. Composition: not more than 50 U. S. P. units of vitamin D per gram, whereas represented to contain 85 such units.—[*D. D. N. J., F. D. C. 84; May 1940.*]

Magic-Di-Stik Lash and Brow Dye.—Magic-Di-Stik Co., Los Angeles. Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 3 and 4; May 1940.*]

Madam Marva Hair Coloring.—Madam Marva Products Co., St. Louis. Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 14; May 1940.*]

Tru-Lax Mint Flavored Chewing Laxative.—Peltz-Kauffer Co., Inc., South Bend, Ind. Composition included 1 grain of phenolphthalein. Dangerous to health if used as directed.—[*D. D. N. J., F. D. C. 43; May 1940.*]

Universal Formula.—Universal Antiseptic & Research Laboratories, Inc., Bristol, Tenn. Composition: essentially alum, borax, sugar, water, carbolic acid (1.84 per cent) and small proportions of aromatic substances, including thymol and sage. Not antiseptic when diluted as directed on label. Falsely represented as efficacious for sinus trouble, quinsy, asthma, catarrh, tonsillitis, croup and a great many other disorders.—[*D. D. N. J., F. D. C. 46; May 1940.*]

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ADDICTION TO AMPHETAMINE (BENZEDRINE) SULFATE

To the Editor:—**A man who has become addicted to the use of benzedrine sulfate has been taking the drug now for nearly two and one-half years on an average of a dozen 10 mg. tablets daily and has taken as many as twenty-four a day. Briefly, he was a confirmed alcoholic addict and after a terrific debauch in February 1938 he wanted something to pep him up and also something to take when he felt the craving for alcohol. More in the spirit of experimentation than anything else I prescribed benzedrine sulfate tablets, two daily. I didn't see him for several months; then he came looking fine; he had gained weight and claimed that the taking of the drug had completely banished his desire for alcohol. He said, however, that if he missed taking the benzedrine he would get a terrific craving. I warned him at that time about the possible danger of the drug but decided it was the lesser of two evils. I lost track of him for some time. A few weeks ago he turned up for a prescription, since a new state law recently passed requires one for all such drugs. He then told me he had been taking them continuously and at the rate of ten or twelve daily. He is an automobile salesman and claims that he can't carry on his daily routine without them. Withdrawal causes nervousness, exhaustive fatigue and inability to think straight and, believe it or not, sleeplessness. He has not lost any weight since I first saw him and appears to be in fairly good health. In spite of the fact that he has been a lifetime drunkard he has not touched a drop since he began taking the tablets. He is a white man aged 49, he weighs 123 pounds (56 Kg.) and his blood pressure is 115 systolic, 90 diastolic. He is in good health otherwise except for a hernia he has had for twenty years and a recently developed fistula in ano. Please advise me how I can get him off the drug, also what organic effects it will cause if he continues its use. Please bear in mind the danger of his resuming his alcoholic course if I suddenly withdraw the drug.**

L. J. Hahne, M.D., Savannah, Ga.

ANSWER.—Until recently there have been no specific reports of cases of addiction to amphetamine (benzedrine) sulfate, although the Council on Pharmacy and Chemistry has repeatedly warned physicians against such a possibility ever since this was first pointed out in its report on the drug (Report of the Council on Pharmacy and Chemistry, Present Status of Benzedrine Sulfate, THE JOURNAL, Dec. 18, 1937, p. 2064). At that time the question of tolerance to the drug and the possibility of cumulative effects were not definitely settled. S. P. Waud has since reported (The Effects of Toxic Doses of Benzyl Methyl Carbinamine (Benzedrine) in Man, THE JOURNAL, Jan. 15, 1938, p. 206) that a definite tolerance for amphetamine is slowly built up and that increasing doses are necessary to produce the original effects. While indicating that the question of addiction was not settled at that time, he pointed to its likelihood as a possibility because "most drugs that produce a pleasant effect on the brain (either stimulating or quieting in nature) have their addicts." He also indicated that the stimulation of the central nervous system is definite but relatively temporary and is always followed by fatigue and mental depression when toxic doses of amphetamine are absorbed. THE JOURNAL later published an editorial (Benzedrine Sulfate—A Warning, March 19, 1938, p. 901) warning against the use of the drug for the treatment of obesity in otherwise normal individuals by reducing the appetite, because of the danger that such use may produce craving and even addiction in some instances. Furthermore, severe reaction and even death have been reported following the indiscriminate use of amphetamine sulfate (Apfelberg, Benjamin: A Case of Benzedrine Sulfate Poisoning, THE JOURNAL, Feb. 19, 1938, p. 575. Smith, L. C.: Collapse with Death Following the Use of Amphetamine Sulfate, *ibid.*, Sept. 9, 1939, p. 1022).

A case of addiction resulting from the continued use of amphetamine sulfate has recently been reported (Friedenberg, Sidney: Addiction to Amphetamine Sulfate, *ibid.*, March 16, 1940, p. 956). The drug was administered over a period of six months in doses of from 5 to 10 mg. twice a day for the treatment of obesity. Reduction of the dosage after this time was followed by fatigue and depression and a demand for larger doses. The author did not suggest a method for management of the addiction in this case but indicated that the problem was not a minor one and that possible deleterious results from long continued use have not yet been fully investigated. He reported no change in blood pressure, but hypertensive effects from the use of amphetamine (benzedrine) have also been reported (Morse, Withrow: Effects of Benzedrine on Blood Pressure, THE JOURNAL, Nov. 7, 1936, p. 1582. Beyer, K. H.: *J. Pharmacol. & Exper. Therap.* **66**:318 [July] 1939).

The patient with addiction to amphetamine sulfate described in the inquiry appears to have developed a tremendous tolerance to the drug and in spite of the fact that no increase in blood pressure or loss of appetite or weight has been noted he may reasonably be expected to display more of the usual reactions due to the drug as tolerance is lowered by reduction in the dosage. Dautrebande, Philippot and Charlier (Pharmacodynamic Study of Benzedrine in the Animal, *Arch. Internat. de pharmacod. et de therap.* **62**:179 [June 30] 1939) indicate that both large and small single doses produce immediate hypertension but that large doses produce hypotension when a large dose has previously been given. This suggests a possible explanation for the absence of hypertension in the case in question. A high degree of tolerance would also tend to eliminate the outward signs of stimulation of the central nervous system. The appearance of nervousness and sleeplessness on withdrawal of the drug, however, is probably the result of irritability of a nervous system long subjected to stimulation, somewhat analogous perhaps to that which occurs in opiate addiction. Rapid reduction in the number of doses rather than the size of the dose or sudden complete withdrawal is regarded as the preferred method of management of addiction to most drugs and probably causes less suffering than gradual decrease in the size of the dose. The possibility of sudden collapse must be kept in mind however and, in view of the meager information concerning the effects from prolonged use, the patient should be institutionalized to afford constant surveillance and treatment of withdrawal symptoms. Barbiturates are recognized as useful in controlling overdosage of amphetamine sulfate and may be useful together with other sedatives to control insomnia, restlessness and other symptoms of withdrawal. Care must be taken to avoid addiction to these other drugs also. The memory of the feeling of well-being or exhilaration from the psychic stimulation produced by the drug may be controlled by scopolamine hydrobromide. After the immediate symptoms of withdrawal have subsided, the principal effort should be directed to psychotherapy. In the case described, the problem of addiction apparently still persists since this has been merely transferred from alcohol to amphetamine sulfate. Unless a change in the mental attitude can be brought about the patient is likely to return to the use of stimulants of one kind or another at the first opportunity. Apparently the drug has demonstrated to the patient that he can get along without alcohol and the same now must be shown for the drug.

The Council on Pharmacy and Chemistry has recently recognized the use of amphetamine sulfate as an adjunct in the treatment of chronic alcoholism on the basis of evidence that the use of the drug in such cases may permit a sufficient interval of sobriety for the institution of the usual and more fundamental psychotherapeutic approaches (Reifenstein, E. C., Jr., and Davidoff, Eugene: The Treatment of Alcoholic Psychoses with Benzedrine Sulfate, THE JOURNAL, May 28, 1938, p. 1811. Bloomberg, Wilfred: *New England J. Med.* **220**:129 [Jan. 26] 1939). Reifenstein and Davidoff report best results in states of intoxication in which no psychosis is demonstrable. Bloomberg points out, however, that the drug is by no means a solution of the difficult problem of alcoholism but may be useful in cases in which there can be proper supervision. Bloomberg was quoted in Queries and Minor Notes (Amphetamine [Benzedrine] Sulfate for Alcoholism, THE JOURNAL, March 11, 1939, p. 1010) to emphasize that the probable real value of the treatment lies in the opportunity it may provide to inaugurate psychotherapy so that the gain made by improved rapport, confidence and sobriety may be consolidated by the more fundamental modifications of the alcoholic addict's personality and his attitude toward life. As is also indicated in this note, the Council has repeatedly deplored the use of amphetamine sulfate except under the strict and constant supervision of the physician.

TREATMENT OF POLYCYTHEMIA VERA

To the Editor:—**What can be used to reduce the blood in polycythemia vera besides phenylhydrazine hydrochloride? I am a victim of this disease and want something besides phenylhydrazine hydrochloride.**

M.D., Idaho.

ANSWER.—Polycythemia rubra vera always shows an increase in total blood volume as well as an increase in red cells per cubic millimeter, so the total mass of red cells may be exceedingly high. The purpose of treatment is to dispose of this excess. Acetyl phenylhydrazine is less toxic than phenylhydrazine and is the drug of choice. The effect of the drug depends on the sensitivity of the patient and the number of red cells to be destroyed, so a set dosage cannot be followed. Usually 0.1 Gm. of acetyl phenylhydrazine can be given daily for ten days. A blood count should be done each day. With a rapid drop in cells or the development of jaundice the drug should be dis-

continued until the full effect is obtained. The amount of drug necessary to keep the count down must be determined for each patient. Often one dose (0.1 Gm.) weekly is sufficient.

Since the treatment of polycythemia rubra vera is unsatisfactory with any drug, the tendency now is to rely entirely on venesections, thus producing a relative iron deficiency anemia. Large amounts of blood must be removed. If possible the amount to be removed should be calculated from the blood volume. Most untreated patients must have from 4 to 5 liters of blood withdrawn. After venesection the red cells become smaller, so that the red cell count is not a good indicator of the effect of a need for venesections. The venesections have to be repeated at intervals of from six to twelve months.

Irradiation is a third method of treatment. It seems best to irradiate the entire body rather than the bones alone. This procedure works well for some patients and is ineffectual for others.

ALTITUDE AND CHRONIC MALARIA

To the Editor:—**I read with interest the answer in Queries and Minor Notes July 20 under "Treatment of Chronic Malaria." The discussion parallels experience with myself and many patients. I have had chronic malaria eleven years and have taken varied forms of treatment for from two to three months each spring and fall with partial relief during the time of actually taking treatment but with no lasting results. I will not attempt to enumerate all the drugs or combinations of drugs that I have taken during the eleven years but I have used them all except the Ascoli technic and it is my understanding that this technic creates an artificial high altitude. Am I correct in this assumption? The altitude of this city is about 200 feet and I have been here eleven years except for one period of two months spent in Boston, during which time I became entirely symptom free. What altitude is considered best for becoming free from parasites under proper antimalarial treatment? One little girl aged 6 years has had malaria since birth. What routine has been found most effective in treating children of this age? I find myself entirely agreeing with your statement that the treatment of chronic malaria is not the simple task it was thought to be ten years ago.**

M.D., North Carolina.

ANSWER.—The "artificial high altitude" which the Ascoli technic produces is more apparent than real. In epinephrine therapy erythrocytes are supposedly squeezed out of the blood sinuses of the spleen and other viscera and surge through the peripheral circulation in greater numbers. However, this result is fugitive, whereas normal compensation to low oxygen tension in high altitudes results in a more or less permanent increase in the hematocrit. In attempting to recover from malaria, altitude is much less important than a cool, stimulating climate, combined with a well balanced diet and moderate exercise. Thus New England, the Appalachian highlands, Minnesota and Colorado are all good climates for patients with chronic malaria. Should relapses occur in bracing climates, adequate chemotherapy is more likely to be effective there than in the warm, enervating climates of the tropics.

SUNBURN AND SULFANILAMIDE ADMINISTRATION

To the Editor:—**Could you give me any available information as to whether sunburn is a contraindication to the administration of sulfanilamide?**

Louis Sohn, M.D., Brooklyn.

ANSWER.—Sunburn in itself is not a contraindication to the administration of sulfanilamide or its derivatives, provided there is a good reason for using these drugs. It has been definitely established that it is unwise for a patient who is receiving one or the other of these drugs to expose himself to the direct rays of the sun during a course of treatment, because in a certain number of instances photosensitization will take place and a dermatitis will result. For this reason patients who are receiving these drugs should keep out of the sun until from two to four days after the administration of the drug has ceased. This latter precaution is recommended in order to permit the drug to be completely excreted and hence to avoid possible photosensitization.

NO CHANGE IN WASSERMANN REACTION FROM SULFANILAMIDE

To the Editor:—**Can a successful Wassermann test be made on a patient with a rash due to medication with sulfanilamide?**

Frank E. Wiedemann, M.D., Terre Haute, Ind.

ANSWER.—As far as evidence is available there is no reason to believe that therapy with sulfanilamide or its derivatives produces changes in or reversals of the Wassermann reaction. In the course of a large experience no difficulty has been experienced in obtaining correct interpretations of the Wassermann reaction in cases of toxic dermatoses which had been produced by the administration of sulfanilamide.

BLUISH DISCOLORATION OF GUMS

To the Editor:—**A woman aged 28, single, has a bluish-purple discoloration of the upper and lower gums. This is of five days' duration. She complains of tenderness of the gums, but there has been no bleeding or ulceration. The color is homogeneously distributed, not in a line. The only other complaint she mentions is vaginal bleeding for two days following cessation of her regular period. The discoloration is only of the gums. The tongue, throat and lips are normal. Physical examination is essentially negative. The red blood cell count is 3,800,000, the white cell count 7,500; hemoglobin 78 per cent; polymorphonuclear leukocytes 62 per cent, lymphocytes 27 per cent, eosinophils 8 per cent and monocytes 3 per cent. The red cells are normal in appearance. Coagulation and bleeding times are normal, as is the clot retraction. Urinalysis is normal. The Wassermann test also is negative. There is no history of exposure to lead, mercury or bismuth, or any mouth washes or other medicines. I am unable to find the cause of her complaint and would appreciate any suggestions you may have to offer with regard to further investigation or possible etiology.**

M.D., Pennsylvania.

ANSWER.—A diagnosis cannot be made from the data. A bleeding disorder in its early stages, or a disorder with bleeding as a symptom, would be suggested. Such conditions as purpura, scurvy or aleukemic leukemia are to be kept in mind. Purpura with an allergic cause has been described, and the eosinophilia would fit this possibility.

Additional information is needed, especially a platelet count. The size of the spleen is important, as is the appearance of the rectal and vaginal mucosa. (It is presumed that the patient is afebrile.)

Repetition of other examinations may be necessary. The total white blood count and differential, and the bleeding tests should be rechecked. A determination of the vitamin C level of the blood, followed by an empirical use of a vitamin C concentrate, might be done if still indicated; cutaneous tests for important allergic substances can also be done if indicated. Further therapy will depend on the condition found. At times the diagnosis may be obscure, with only a progressive anemia as its evidence.

STERILIZATION IN HEART DISEASE AND TUBERCULOSIS

To the Editor:—**What reason can one give for doing a major surgical procedure (sterilization) on a woman who has tuberculosis or heart disease when a minor operation can be performed on her healthy husband? Why should one not do a bilateral vasectomy on the husband instead of a tubal resection on a bad risk wife? I refer especially to those women who already have a child or children.**

M.D., New York.

ANSWER.—As a general proposition it is probably better to perform a sterilization operation on the partner who has a disease serious enough to demand the procedure. This is especially true in diseases such as tuberculosis, which may be rather rapidly progressive and eventually kill the patient. It does not seem quite fair to sterilize a healthy young man whose wife has either a severe tuberculosis or heart disease, because at some later date he may wish to remarry and have other children.

Sterilization of women can be rapidly performed in most instances by the vaginal route with but little risk and only a short hospitalization, and with a minimum amount of trauma. If the general condition is severe, this procedure can be accomplished under morphine-scopolamine and local anesthesia in the vast majority of cases. If the vaginal procedure is not possible and laparotomy becomes necessary for tubal resection, sterilization of the man may more definitely be considered. Each case should be considered separately and judged by the age of the couple, the number of children and the financial ability to care for further children.

CHRONIC SINUSITIS AND SULFANILAMIDE

To the Editor:—**Please send me whatever information regarding the status of sulfanilamides in the treatment of chronic sinus infections you have. As I am afflicted with an incurable sinus condition, the predominant organisms being Staphylococcus aureus and albus, I am wondering whether one of the sulfanilamides could be of benefit in this condition.**

Charles Kantor, M.D., Summerhaven, Mount Lemmon, Ariz.

ANSWER.—Sulfanilamide and its derivatives have been used with moderate degrees of success in the treatment of acute sinusitis due to beta hemolytic streptococci, pneumococci and staphylococci. In almost all instances, however, some type of drainage has to be used concomitantly with therapy with sulfanilamide or its derivatives. In chronic sinusitis, reports on the use of sulfanilamide or its derivatives have been discouraging. The reason for the failure of sulfanilamide to benefit patients ill with chronic sinusitis probably lies in the fact that reinfection from the nasopharynx and nose is constantly taking place. Hence, while temporary chemotherapeutic effects may be obtained, the cessation of drug therapy is almost always followed by prompt recurrence of the infection in the affected sinus or sinuses.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examination of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, October 26, page 1478.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, February. Part III. Boston during November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers, Feb. 20. Final date for filing application is December 21. *Oral.* Part II. Cleveland, May 31-June 1. Final date for filing application is April 1. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Chicago, Dec. 6-7. Applications for Group A are closed. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Parts 1-A and 1-B, Feb. 17. Final date for filing application is Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Part II, Groups A and B, Cleveland, May 28-June 2. Final date for filing application is March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Cleveland, May or June. *Written.* Various centers, March 8. *The only written examination during 1941.* Applications must be on file not later than Dec. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and written.* New Orleans, January 1941. Final date for filing application is November 15. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PATHOLOGY: *Oral and Written.* Cleveland, June 1-2. Final date for filing application is May 1. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, March 30-31, following the Region I meeting of the American Academy of Pediatrics. Chicago, May 18, following the Region III meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF UROLOGY: *Oral and Written.* All groups. Chicago, Feb. 14-16. Final date for filing application is Nov. 10. Sec. Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

North Carolina June Report

Dr. W. D. James, secretary, Board of Medical Examiners of North Carolina, reports the written examination for medical licensure held at Raleigh, June 17-21, 1940. The examination covered sixteen subjects and included seventy questions. An average of 80 per cent was required to pass. Sixty-five candidates were examined, all of whom passed. Thirty-four physicians were licensed to practice medicine by reciprocity and nine physicians so licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Howard University College of Medicine	(1936) 84.5, (1939) (1940) 86.8, 89.1, 90.9		90.2,
Emory University School of Medicine	(1940)	88.9,	93
Rush Medical College	(1940)	91.3,	92
University of Chicago, The School of Medicine	(1940)		91.6
Tulane University of Louisiana School of Medicine	(1940)		88.9, 89.1, 91.6
Johns Hopkins University School of Medicine	(1940)		81.9, 88.6, 91.6
University of Maryland School of Medicine and College of Physicians and Surgeons	(1940)	85.2, 88,	88.1, 88.1, 88.9, 89.7, 90.5, 91.3
Boston University School of Medicine	(1939)		88.2
Harvard Medical School	(1940)	91.5,	94.3
Washington University School of Medicine	(1940)	88,	90.6
Cornell University Medical College	(1940)		90.5
University of Rochester School of Medicine	(1940)		90.6
Duke University School of Medicine	(1938)		87.8, 88.7, (1940) 83.1, 83.2, 86.8, 86.9, 90.6
Hahnemann Medical College and Hospital of Philadelphia	(1940)		93.6
Jefferson Medical College of Philadelphia	(1940)	87.8,	88.3, 88.7, 91.3, 91.4, 91.7, 92.2, 92.6
Temple University School of Medicine	(1940)		86.5, 87, 88.2, 88.6, 90
University of Pennsylvania School of Medicine	(1940)		90.3, 90.8, 91, 91.5, 92.8
Medical College of Virginia	(1939) 88.1, (1940)		86.8, 87.9, 91.5, 91.6, 92.1, 92.2
University of Virginia Department of Medicine	(1940)		90.1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine	(1917)		S. Carolina
Emory University School of Medicine	(1928), (1936) (1932) South Carolina		Georgia,
University of Georgia Medical Department	(1928)		Georgia
Northwestern University Medical School	(1925)		Illinois
State University of Iowa College of Medicine	(1937)		Iowa
University of Louisville School of Medicine	(1937)		New York
Tulane University of Louisiana School of Medicine	(1932)		Tennessee
Johns Hopkins University School of Medicine	(1921)		Maryland
Harvard Medical School	(1932) Rhode Island, (1936)		New York
Washington University School of Medicine	(1938)		Missouri
Duke University School of Medicine	(1933)		Connecticut, (1935) Ohio
Jefferson Medical College of Philadelphia	(1938)		Penna.
Temple University School of Medicine	(1934)		Dist. Colum.
University of Pennsylvania School of Medicine	(1933)		W. Virginia, (1936) Pennsylvania
Meharry Medical College	(1938, 3), (1939, 3)		Tennessee
University of Tennessee College of Medicine	(1931)		Tennessee
Vanderbilt University School of Medicine	(1933), (1935)		Tennessee
Medical College of Virginia	(1929), (1933)		Virginia
University College of Medicine, Richmond	(1913)		W. Virginia
University of Virginia Department of Medicine	(1937), (1939)		Virginia
University of Western Ontario Medical School	(1933)		Alabama

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Cornell University Medical College	(1930)		N. B. M. Ex.
Duke University School of Medicine	(1934, 2), (1935), (1936, 3), (1937)		N. B. M. Ex.
University of Wisconsin Medical School	(1935)		N. B. M. Ex.

Texas June Report

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination for medical licensure held at San Antonio, June 17-19, 1940. The examination covered twelve subjects and included 120 questions. An average of 75 per cent was required to pass. Two hundred and three candidates were examined, 180 of whom passed and twenty-three failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Tulane University of Louisiana School of Medicine	(1940)		81.3, 81.4, 82.8
Harvard Medical School	(1935) 82.3, (1940)	77.8,	83.5
New York Medical College, Flower and Fifth Avenue Hospitals	(1940)		79.1
University of Oklahoma School of Medicine	(1939)		79.8
Duke University School of Medicine	(1940)		79.4
University of Pennsylvania School of Medicine	(1939)		80.6, (1940) 82.2
University of Tennessee College of Medicine	(1939)		82
Baylor University College of Medicine	(1940)		75, 75.2, 75.3, 75.6, 75.8, 75.8, 76.5, 76.5, 77.2, 77.4, 77.6, 77.6, 77.6, 78.2, 78.5, 78.6, 78.7, 78.8, 78.8, 79, 79.1, 79.3, 79.5, 79.7, 79.7, 79.9, 80.1, 80.4, 80.5, 80.5, 80.7, 80.7, 80.8, 81.1, 81.3, 81.3, 81.3, 81.4, 81.5, 81.8, 82, 82.1, 82.3, 82.3, 82.9, 83, 83, 83.1, 83.2, 83.4, 83.5, 83,8, 83.8, 83.9, 84.1, 85, 85.2, 85.3, 85.7, 85.9, 86, 86.4, 86.8
University of Texas Faculty of Medicine	(1939) (1940)		82.5, 75, 76.1, 76.6, 76.9, 77.5, 77.5, 77.6, 77.6, 78, 78.2, 78.5, 78.5, 79, 79, 79, 79.1, 79.1, 79.3, 79.5, 79.5, 79.6, 79.6, 79.8, 79.9, 80.3, 80.4, 80.6, 80.6, 80.6, 80.8, 80.8, 81, 81, 81.2, 81.3, 81.4, 81.5, 81.5, 81.6, 81.8, 82, 82, 82.1, 82.3, 82.3, 82.3, 82.5, 82.6, 82.7, 82.8, 82.8, 82.9, 83, 83, 83.1, 83.2, 83.3, 83.4, 83.5, 83.6, 83.6, 83.6, 83.7, 83.7, 83.8, 84, 84, 84, 84.1, 84.1, 84.2, 84.2, 84.3, 84.5, 84.5, 84.6, 84.8, 85.3, 85.4, 85.6, 86.5, 86.5, 87.8
University of Texas School of Medicine	(1938)		80.3
University of Manitoba Faculty of Medicine	(1940)		79
Friedrich-Wilhelms Universität Medizinische Fakultät, Berlin	(1925)		80.2
Osteopaths *	75.7, 76.1, 76.5, 76.5, 77.5, 77.6, 78.1, 79, 79.6, 79.9, 80, 80.4, 81.3, 81.8, 82, 83, 83.5, 85.6		

School	FAILED	Year Grad.	Number Failed
Northwestern University Medical School	(1940)		1
Washington University School of Medicine	(1940)		1
Baylor University College of Medicine	(1940, 11)		11
University of Texas Faculty of Medicine	(1940, 4)		4
Magyar Királyi Ferencz József Tudományegyetem Orvostudományi Kara, Szeged	(1914)		1
Japan Medical College	(1910)		1
Universidad Nacional Facultad de Medicina, México	(1937)		1
Osteopaths *			3

* Examined in medicine and surgery.

Colorado June Report

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination for medical licensure held at Denver, June 12-14, 1940. The examination covered eight subjects and included ninety questions. An average of 75 per cent was required to pass. Fifty-two candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1940) 79.3, 81,		81
University of Southern California Medical School	(1940)		81
University of Colorado School of Medicine	(1938) 84, (1940) 78.3, 79.3, 79.5, 79.5, 80, 81, 81, 81, 81, 81, 81, 81, 81, 81.5, 82, 82, 82, 82, 82, 82.3, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83.3, 83.3, 83.5, 83.5, 84, 84.3, 85, 85, 85, 85, 85.3, 87		78,
Loyola University School of Medicine	(1939)		84.3
University of Nebraska College of Medicine	(1940)		79.3
University of Buffalo School of Medicine	(1939)		85.3
University of Wisconsin Medical School	(1938)		87

Book Notices

Care of Poliomyelitis. By Jessie L. Stevenson, A.B., R.N., Consultant in Orthopedic Nursing, National Organization for Public Health Nursing. Cloth. Price, $2.50. Pp. 230, with illustrations. New York: Macmillan Company, 1940.

This book is timely, practical and accurate. It is written by a nurse who has demonstrated mature, discriminating judgment. Miss Stevenson has presented an unbiased evaluation of various conceptions, procedures, maneuvers and methods. The book has grown out of the study, observation and experience of the staff of the orthopedic division of the Visiting Nurse Association of Chicago. It is presented in the hope that it will be useful to others who share in the care of poliomyelitis patients. The manuscript has been read in whole or in part by instructors, supervisors and staff nurses in public health nursing, instructors in physical therapy departments, and directors and members of staffs of state agencies for the care of crippled children. The value of care in handling the acutely ill patient is emphasized. The discussion on postural considerations is excellent. The author has taken meticulous care in describing the simplest details. These include the value of serum, the incomplete or complete arc movement and underwater exercises. The author was careful in choosing her source material and was accurate in quoting and paraphrasing the writings and teachings of her predecessors. The references are valuable. Many personal experiences are interspersed. Dr. Hektoen considers the description of the nature, the virus, the apparent modes of spread, the structural changes, the course of the attack, the treatment of the acute stage and the period of recovery of poliomyelitis to be in full accord with the present understanding and teaching of the disease. The author provides a sound and substantial basis for an intelligent grasp of the principles of the convalescent care, early and late, explained with a mastery of detail. Miss Deming of the National Organization for Public Health Nursing states that "public health nurses will welcome this book. Stevenson is an authority on the subject of orthopedic nursing. The book will be particularly helpful to those public health nurses in the field who are responsible for supervising the care which the family gives the victims of poliomyelitis. Many of the instructions are applicable also to other types of crippling conditions as well as poliomyelitis. The book is full of practical examples of how to administer care and includes many teaching points. It is also very well illustrated. Our home teaching very much needs this type of instruction and guidance. The book, therefore, will be doubly welcome to the supervisors and instructors of public health nurses."

Dermatologic Therapy in General Practice. By Marion B. Sulzberger, M.D., Assistant Clinical Professor of Dermatology and Syphilology, Skin and Cancer Unit of the New York Post-Graduate Medical School and Hospital of Columbia University, New York, and Jack Wolf, M.D., Attending Dermatologist and Syphilologist, Skin and Cancer Unit of the New York Post-Graduate Medical School and Hospital of Columbia University. Cloth. Price, $4.50. Pp. 680, with 65 illustrations. Chicago: Year Book Publishers, Inc., 1940.

This work, like most of Sulzberger's "practical utterances," is a painstaking attempt to present to the general practitioner a book on the management of the common skin diseases that the authors "hope will prove useful to the general practitioner." Little mention is made "of many details of morphology or of differential diagnostic finesse." The authors are to be commended for only lightly mentioning roentgen and radium therapy because these agents are used too frequently by "x-ray specialists" and laboratory technicians without proper special diagnostic training. The work describes many practical procedures for the management of skin diseases in greater detail than found in the usual comprehensive textbook, and much material has been taken from previous writings in the Year Book and medical journals and Sulzberger's wide contact with therapy in his own practice and from contact with his preceptors in continental Europe. The details of dermatologic therapy are well presented. In addition to complex therapy, dermatology has a complex diagnostic approach and the reviewer feels that the authors allocate to the average general practitioner a knowledge in properly classifying skin diseases that they do not ordinarily possess. For therapeutic reference it is essential that they know the entity for which they are prescribing or seeking management advice. The general practitioner who is secure in his diagnosis of a wart or psoriasis will find in this work a number of therapeutic suggestions but will have to decide for himself which treatment to use. The following statement in the section on senile pruritus on page 546 is a highlight of ambiguity: "The condition is usually easily managed, but in some cases proves particularly rebellious to treatment." Chapter XIII, on drug eruptions, is superbly done. Table 14 on page 552, listing common drugs causing eruptions and characteristic forms of eruptions, is excellent and should be of great value to the practitioner in running down drugs as a causal factor in an eruption. This book should prove of great value to the erudite practitioner who has still retained some of his cutaneous diagnostic orientation and desires aid in therapeutic approach and should also be of great value to the novice in dermatology with a restricted therapeutic horizon. It is a valuable practical addition to the dermatologist's library and to that of the general practitioner who desires to treat dermatologic conditions with more armaments than calamine lotion and sulfur and Whitfield ointments. Chapters XV and XVI, on syphilis, are superbly done and should be read and reread by the general practitioner.

Pneumoconiosis Among Mica and Pegmatite Workers. By Waldemar C. Dreessen, Passed Assistant Surgeon, United States Public Health Service, and others. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 250. Paper. Price, 15 cents. Pp. 74, with 30 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

The report includes (1) detailed descriptions of the process of mining and quarrying pegmatite rock, the milling of its major constituents, mica, feldspar and quartz, with a section on hydraulic mining and processing of kaolin; (2) the concentration of atmospheric dusts generated in these different processes; (3) complete medical data obtained from examining fifty-seven men exposed to fine silica-free mica dust, thirty-one men and seventy-eight women fabricators of sheet mica, ninety-five men exposed to kaolin dust, 741 men mining the pegmatite and sorting its chief constituents, and a control group of 245 applicants for work who had had no previous exposure to dust.

For details of this carefully conducted study one must consult the original paper. The chief conclusions of the report were that the inhalation of fine mica dust generated in grinding this material caused a pneumoconiosis demonstrable clinically and by x-ray examination, that the fabrication of sheet mica did not liberate enough dust to produce demonstrable pulmonary changes, that mining pegmatite rock under conditions in which dust was generated in concentrations in excess of ten million particles per cubic foot of air would produce typical silicosis after a sufficient period of exposure and that with higher concentrations of dust the probabilities of developing silicosis in a shorter time were even greater. "No appraisal of the pneumoconiosis-producing potentialities of kaolin can be made at this time on the basis of examinations of ninety-five men exposed to practically pure kaolin dust, because only ten men had been exposed to dust concentrations in excess of ten million particles per cubic foot for as long as ten years." Likewise the influence of feldspar could not be evaluated, as this substance was milled in the same building as the quartz, where men were exposed to dusts of both substances. In such mills 8.3 per cent of the men exposed had developed silicosis, whereas in the mine and quarry group only 2.7 per cent showed evidence of such change. The incidence of associated tuberculosis in the whole group was low. Among the total of 1,243 men and women examined there were only six cases of presumptively active infection (0.48 per cent), and of these two were confirmed by subsequent study. This low incidence closely corresponded with that in nearby counties where no mining was carried on. In this connection there is an interesting discussion of the epidemiologic phases of the problem.

The treatment of the subject is somewhat confusing, owing to the variety of minerals under discussion and the implication that each one of them is capable of producing similar pathologic changes and clinical symptoms. Although one section of the report specifically states that the miners exposed to dust containing quartz develop silicosis while the mica millers, breathing

quartz-free dust, are subject only to pneumoconiosis, nevertheless in other places the term pneumoconiosis is used generically to include silicosis. To the reviewer the Public Health Service's scheme for classifying the x-ray shadows produced by reaction to inhaled dusts is a misdirected attempt at simplification. It includes in a single classification shadow patterns produced by three distinct types of pathologic reaction that are provoked by different kinds of minerals. The scheme implies that any form of pneumoconiosis will progress from linear exaggeration through the granular stage to one of nodulation. Pathologically the benign, nonspecific types of pneumoconiosis that have thus far been studied are characterized by linear deposits of dust about the vascular trunks and interlobular septums, asbestosis by a fine diffuse fibrosis involving the alveolar septums, and silicosis by nodules of fibrosis throughout the parenchyma. There is no tendency for one form to pass over into the other.

The report states that this mica pneumoconiosis whose x-ray manifestations resemble those of asbestosis has not been studied pathologically. Since so little is known about this condition, one wishes that its symptoms and physical signs had been tabulated instead of being dismissed with the statement that they "did not differ in nature or in incidence from the symptoms and signs of silicosis." An appendix details the results of animal injections with the mica, kaolin, feldspar and quartz involved in these industries. Intraperitoneal injections of all but the quartz caused "inert" reactions, a type which they "have interpreted as being potentially harmful and capable of producing a diffuse interstitial pulmonary fibrosis as does asbestos." Personal experience with this and other animal tests raises doubts in the reviewer's mind as to the validity of this generalization. Some feldspars with which he has worked have proved incapable of causing any significant tissue reactions. The micas, on the other hand, seem to be more irritating and cause a limited amount of chronic inflammation, particularly in the case of the black mica biotite. They have not been tested in animals' lungs. It is to be hoped that necropsy material from human beings with prolonged exposures to mica dust may be obtained to furnish a basis for the x-ray manifestations of the pneumoconiosis reported.

Meditsinskaya literatura SSSR. Ukazatel knig i statey zhurnalov i sbornikov 1936. God izdaniya shestoy. [Medical Literature of Russia: Index of Books and Articles, Journals and Pamphlets for 1936. Sixth Year of Issue.] Cloth. Price, 50 rubles. Pp. 754. Moscow & Leningrad: Gosudarstvennoe Izdatelstvo Meditsinskoy Literatury, 1939.

The volume is the Russian index medicus for 1936. It lists only Russian publications. The present is the sixth annual volume. The material is catalogued under subject headings and their subdivisions in alphabetical order. There is an authors' index at the end. The size of the volume speaks well for the literature output. When a 1936 index makes its first appearance in 1939, its value to the clinician and the research worker is somewhat questionable. Just what the advantage is of bringing out an index limited to the Russian literature is not quite clear. Methodology has never been a strong point with the Russians. The reviewer's opinion is that our Russian colleagues could learn much by careful perusal of the *Quarterly Cumulative Index Medicus.*

New and Nonofficial Remedies, 1940. Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1940. Cloth. Price, $1.50. Pp. 656. Chicago: American Medical Association, 1940.

The most important function of this book, and of the Council on Pharmacy and Chemistry, of whose deliberations it is the result, is to place before the medical profession a description and estimate of new and useful medicinal preparations as they become available. Even after preparations become official, many brands are retained in New and Nonofficial Remedies by the desire of the manufacturers, who appreciate the care given by the Council in acceptance.

The present volume again reflects contemporary advances in chemotherapy by the inclusion of Sulfapyridine, a derivative of Sulfanilamide which was admitted last year; Sobisminol Mass and Sobisminol Solution, new bismuth compounds, the former having been found efficacious in the oral treatment of syphilis; Fuadin, an antimony derivative which has been known for some years but only recently accepted by the Council for use in the treatment of venereal granuloma and bilharziasis. Other new admissions are Pentothal Sodium, a barbiturate of brief and effective action; Racephedrine with its hydrochloride and sulfate, which as its name indicates is the racemic form of ephedrine; Mercupurin, Salyrgan and Salyrgan-Theophylline solution, mercurials which are used as diuretics.

A glance at the preface shows that some textual revisions are included in the new volume and that a number of products have been omitted as being off the market or as being in conflict with the Council's rules. Noteworthy revisions are those of the chapter on Liver and Stomach Preparations, radically rewritten and including a statement of requirements suggested by conclusions of the Anti-Anemia Preparations Advisory Board of the U. S. Pharmacopeia; the subsection Tuberculins, entirely rewritten to conform to newer knowledge in this field, and the chapter Allergenic Protein Preparations, the name of which has been changed to Allergenic Preparations. Minor but relatively important revisions are found in the articles Bismuth Compounds, Serums and Vaccines, and Vitamins and Vitamin Preparations for Prophylactic and Therapeutic Use.

The book is recommended for all physicians and for all interested in the uses, production or evaluation of drugs.

Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. By E. H. R. Harries, M.D., M.R.C.P., D.P.H., Medical Superintendent, North-Eastern Hospital (London County Council), London, and M. Mitman, M.D., M.R.C.P., D.P.H., Medical Superintendent, River Hospitals, Orchard Dartford, Kent. With a foreword by W. Allen Daley, M.D., F.R.C.P., D.P.H., Medical Officer of Health, London County Council, London. Cloth. Price, $6. Pp. 468, with 31 illustrations. Baltimore: William Wood & Company, 1940.

The authors discuss the clinical aspects of the acute infectious diseases based largely on their own experience as clinicians and teachers; they also discuss the modern fever practice as reflected in the work of others. The opening chapters deal with the sources of infection, resistance to infection, laboratory aids and clinical tests in diagnosis, general management and diet. The student should master this part before proceeding to the chapters on the treatment of the individual infectious diseases, including those that are likely to assume great importance under war conditions, such as epidemic typhus, influenza, tetanus, trench fever and Weil's disease. Prophylaxis is emphasized. While the book is an elaboration of notes on clinical lectures delivered to medical students in London, it provides an account of the clinical aspects of infectious diseases in sufficient detail to be a great help to practitioners of medicine and public health officers in the management of these conditions.

Regional Differences in the Hospitalization and Care of Patients with Mental Diseases. By Joseph Zubin and Grace C. Scholz, United States Public Health Service Associated with the Mental Hospital Survey Committee. Federal Security Agency, United States Public Health Service. Division of Sanitary Reports and Statistics. Supplement No. 159 to the Public Health Reports. Paper. Price, 15 cents. Pp. 94. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

The 416,784 patients with mental diseases in hospitals occupy more than 50 per cent of all the hospital beds in the United States and account for almost one fifth of the expenditures in all hospitals. There were 328 individuals in every hundred thousand of the general population in mental hospitals during 1935. The rate in New England was 449 per hundred thousand while in the East South Central region it was less than half as much, or only 206.

This difference probably reflects lack of facilities rather than difference in the prevalence of mental disease. Ninety-seven per cent of the patients are diagnosed as "with psychosis." The higher percentage of patients "without psychosis" in some states is due to the lack of facilities for the mentally deficient and the epileptic. Mental diseases are primarily a governmental burden, more than 95 per cent of all patients being cared for in governmentally controlled institutions. In accordance with the change in population age groups, the number of first admissions below 50 years of age is decreasing while above that age it is increasing. For the entire country there is an overcrowding of hospitals for mental diseases of 11.4 per cent, but this rate varies largely, being highest in the Pacific region with 23.6 per cent.

Inadequacy of personnel is even more striking. The American Psychiatric Association sets a standard of one physician to 150 patients. There were in 1935 one physician for 258.6 patients, and in the East South Central district the ratio was 445.6

patients per physician. The nursing situation is nearly as bad. To meet the standard of the American Psychiatric Association of one nurse to eight patients there is a need for 10,500 more nurses. Only 11 per cent of the present nursing staff consists of graduate nurses.

The cost of caring for the mentally diseased is more than $230,000,000 annually, or an average expenditure of $534.25 per patient. There is little reason to believe that the geographic differences are as important as the administrative and environmental factors.

Shell Shock in France 1914-18 Based on a War Diary. Kept by Charles S. Myers, C.B.E., F.R.S., Temporary Lieutenant-Colonel, Royal Army Medical Corps. Cloth. Price, $1.25. Pp. 146. Cambridge: University Press; New York: Macmillan Company, 1940.

During the World War Dr. Charles S. Myers was consulting psychologist to the British armies in France. This book is based on his war diary and deals particularly with cases of shell shock and with reeducation. Apparently many cases of a disturbance still called shell shock are occurring in the present war, amplified indeed by the discovery of new weapons more terrifying than any available in 1918. The volume is of special interest, of course, to British physicians but it also provides much that is interesting and useful to physicians everywhere. It is the mark of an intelligent man to learn by his and others' mistakes. Dr. Myers has found even the recollection of many of the errors of 1914-1918 an exceedingly painful performance.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Atlas des Röntgenreihenbildes des Brustraumes auf Grund der Auswertung von über 900000 Röntgenreihenschirmbildern. Zusammengestellt von Hans Holfelder und Friedrich Berner. Fortschritte auf dem Gebiete der Röntgenstrahlen, Ergänzungsband LIX. Herausgegeben von Prof. Dr. Grashey. Paper. Price, 17.50 marks. Pp. 95, with 244 illustrations. Leipzig: Georg Thieme, 1939.

Since the beginning of roentgenology, many attempts have been made to make ordinary photographs of the fluoroscopic screen image. Many difficulties have, until recently, prevented the successful development of this idea. Manoel de Abreu of Rio de Janeiro was probably the first (1936) to make practical application of such a method in a chest survey of large numbers of individuals. The present authors, like de Abreu, have used a 35 mm. camera. A rapid lens and firm mounting of the camera in relation to the screen are prime necessities. The wealth of material represented by a survey of more than 900,000 individuals is exemplified in the atlas. Early tuberculosis was recognized in numerous cases. There is no doubt about the value of miniature camera serial photography of the fluoroscopic screen image as far as concerns case finding or survey studies in pulmonary disease. A special instrument fitted with a magnifying glass serves for rapidly passing the films before the examiner. Such a device is always necessary if one uses such small films. The tendency in the United States is to use a larger film, one about 4 by 5 inches in size, which is still small enough to make real economy in its use and yet large enough to be readily interpreted without enlargement, or at least no greater enlargement than that provided by a simple reading glass.

Pratique médico-chirurgicale. Publiée sous la direction de A. Couvelaire, A. Lemierre, et Ch. Lenormant, professeurs à la Faculté de médecine de Paris. Secrétaire général: André Ravina. Tome X, Deuxième supplément. Third edition. Half-cloth. Price, $5.25. Pp. 671, with 233 illustrations. Paris: Masson & Cie, 1939.

This volume is the second supplement to an eight volume system of the Practice of Medicine and Surgery published in 1931. The first supplement was published in 1936. A wide range of material in all fields of therapy and diagnosis is covered. An index of the scope of the book is given by a few titles: carotid sinus surgery, ski accidents, sulfonamide drugs, pelvic measurements, surgical treatment of tuberculosis, electroencephalograms, treatment of megacolon, cardiac surgery. The illustrations throughout the book are excellent. The treatment of the subject matter differs somewhat in emphasis from the American literature; for example, there is a longer section on ski accidents than on the sulfonamide drugs. However, there is at least brief mention of the most important changes in medical practice to the date of publication. This book should prove a useful compendium and almanac to any one able to read French.

Behind the Scenes of Murder. By Joseph Catton, M.D., Clinical Professor of Medicine, Stanford University, San Francisco. Cloth. Price, $3. Pp. 355. New York: W. W. Norton & Company, Inc., 1940.

This volume results from twenty-seven years of practice in psychiatry, which incidentally gave the author opportunity to act as an expert in such famous cases as those of Winnie Ruth Judd, William Hickman and the famous Massie case in Honolulu. Not only does he provide evidence in support of his views from a considerable number of instances of murder in which he acted as either investigator or witness, but also he makes out of medical testimony and his participation an exceedingly dramatic and excellent literary document. One chapter refers to his clash with Clarence Darrow in the Massie case and throws an extraordinary light on the Darrow methods and technic. This is an important contribution to modern scientific criminology and at the same time one of the most interesting works that have been developed in its field.

Le traitement actuel de la tuberculose pulmonaire. Par P. Weiller, assistant à l'Hôpital Beaujon, et S. Katz, assistant libre à l'Hôpital Beaujon. Préface par le Dr Louis Ramond, médecin de l'Hôpital Laënnec. Paper. Price, 90 francs. Pp. 234, with 57 illustrations. Paris: Vigot Frères, 1940.

This well illustrated booklet is written for the general practitioner. The forms and types of tuberculosis are classified according to practical considerations. Factors in diagnosis, including instructive x-ray reproductions and evaluation of laboratory aids, are intelligently discussed. The indications and contraindications for surgical treatment are dwelt on. Sufficient space is devoted to the discussion of chemotherapy, vaccine therapy, dietetic management and change in environment. The problems of smoking, drinking, sex life and marriage are freely discussed. Special chapters are devoted to tuberculosis in the infant and the aged. The style is clear and simple, and the book will be an asset to the library of the general practitioner.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Differentialdiagnostik der Lungenerkrankungen im Röntgenbilde unter besonderer Berücksichtigung der Queraufnahme. Von Dr. med habil. O. Simon, Leiter der Röntgen-Abteilung der Medizinischen Universitätsklinik Königsberg i. Pr. Fortschritte auf dem Gebiete der Röntgenstrahlen, Ergänzungsband LVII. Herausgeber: Prof. Dr. Grashey. Paper. Price, 17 marks. Pp. 84, with 204 illustrations. Leipzig: Georg Thieme, 1939.

The first half of the work is devoted to text, the latter half consisting of excellent illustrations. In nearly every instance the author shows the anteroposterior film as well as the lateral, thus facilitating the comparison of the two projections. Any one not already convinced of the value of the lateral film in thoracic roentgenology would do well to study this atlas. It is brimful of interesting cases, some of which would not have been diagnosed except with the aid of the lateral film.

Obesity and Leanness. By Hugo R. Rony, M.D. Cloth. Price, $3.75. Pp. 300, with 32 illustrations. Philadelphia: Lea & Febiger, 1940.

Here, planned particularly for the general practitioner, is a scientific discussion of obesity and leanness. Many a practitioner today is confronted by representatives of each of these groups anxious to transfer to the other. Scientific control of either obesity or leanness demands a thorough understanding of the physiology and pathology of fat, of the physiology of hunger, and of rest. Dr. Rony inclines to the concept of physiologic bookkeeping with, of course, a recognition of pathologic studies in which the glands have failed to function. The third portion of the book is wholly clinical. It considers indications and contraindications for reduction of weight and also for the use of thyroid glandular material and other methods in controlling and maintaining weight.

A Man Who Found a Country. By Dr. A. Nakashian. Cloth. Price, $2.75. Pp. 279, with illustrations. New York: Thomas Y. Crowell Company, 1940.

Dr. Nakashian was born in a Turkish town but he is an Armenian. His life reflects first hand the constant difficulties of Armenians with Turks and the place that the American missionaries occupied, particularly in aiding the Armenians. He graduated from the American College in 1887 and decided to take up medicine. He describes how it was necessary to purloin corpses in order to secure material for dissection. Briefly, he became a soldier and learned Arabic. In 1894 he received a

degree in medicine; he then went for further study to Constantinople. Here he began medical practice under difficult conditions. Like many a physician of earlier days he moved toward success by surgery on the governor. After becoming a captain in the Turkish army, being drafted into military service, he became physician to a bandit chief. His story ends with his departure for America. The story is a simple, first hand account of an extraordinary medical career.

Sex Adjustments of Young Men. By Lester A. Kirkendall, Ph.D., Associate Professor of Education, Teachers College of Connecticut, New Britain, Conn. Foreword by Percival M. Symonds. Cloth. Price, $2. Pp. 215. New York & London: Harper & Brothers, 1940.

The book is the result of twelve years of counseling work with boys and young men. He describes in detail with adequate documentation commonly found forms of sex adjustment among young men, commonly held misconceptions concerning sex and certain histories of actual case histories of difficulties of adjustment among young men. This material is well worth study by psychiatrists working with college students or adolescents. Disappointment with the chapter dealing with desirable sex adjustments will be felt by all psychiatrists engaged in therapy. Among thirteen precepts to be followed are Do not be disturbed by manifestations of sex, Do not toy with sex or put yourself in the way of stimulation, Plan how you will meet difficult situations before they arise and Adopt an attitude that is direct, objective, free from lewdness and obscenity. Perhaps it is too much to hope that a college professor should have a realistic attitude toward life, but surely some inkling of man's terrific struggle against his instincts should by now have permeated to teachers of education.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Liability for Failure to Place Sideboards on Patient's Bed.—Mrs. Potter was admitted to the defendant hospital Thursday, February 16, in a very restless and nervous state. At times she was irrational. A special nurse was employed to attend her during the night and was retained through the following Sunday night, February 19. Sideboards were placed on the patient's bed the first night of her stay in the hospital but were not used thereafter. On Monday the special nurse was dismissed on the advice of the defendant's supervisor of nurses, who thought further employment unnecessary because the patient "apparently was rational and was so much quieter." About midnight Monday a student nurse visited the patient's room and found her "quiet and rational," but on her return about five minutes later she found Mrs. Potter sitting on the edge of the bed with her legs and feet dangling, apparently preparing to leave her bed to go to the bathroom. The patient fell but the nurse caught her by the shoulders. The patient fractured her femur in the fall and two days later died of pneumonia. The surviving husband and children of the patient sued the hospital, contending that her death had been proximately caused by the fall, which in turn was the result of the hospital's negligence in not placing sideboards on the patient's bed the night of the fall. At the close of the evidence the trial court refused to direct a verdict in favor of the hospital and entered judgment for the plaintiffs on the verdict of the jury. The hospital then appealed to the Supreme Court of Idaho.

The theory of the plaintiffs' claim, said the Supreme Court, is that, since sideboards were placed on the patient's bed the first night she was in the hospital and since none were on her bed the night of the fall, the hospital was negligent in not placing sideboards on the bed the latter night and that such negligent omission resulted in her fall and injury. The plaintiffs contended that the patient's condition was such on the night of the fall that the hospital attendants should have known that she might become irrational at any moment or that she might be expected to try to get out of bed. But, answered the Supreme Court, the uncontradicted testimony of the student nurse is that five minutes before the fall the patient was conscious and was resting quietly. The record shows that the patient had been quiet during the daytime on Monday and there is no evidence to show that the hospital could or should have inferred that the patient on the night of the fall would conduct herself differently from other patients who were "resting quietly." Surely a hospital is not bound to place sideboards on the bed of every patient. One of the defendant's nurse supervisors testified that in her opinion there is no need for the use of sideboards when a patient is in a condition such as Mrs. Potter was in on Monday. Moreover, there was testimony that the use of sideboards for conscious patients may even be bad therapy since such patients can, and often do, crawl over sideboards, and any resulting fall, occurring as it does from a greater height, is likely to have more serious consequences. In the opinion of the court, there was no evidence to show that in not attaching sideboards to the patient's bed the hospital had failed to exercise due care prior to and at the time of her injury. The mere fact that a sideboard was placed on the patient's bed immediately after her fall did not justify an inference that due care required the hospital to put on sideboards before the fall. After the fall the hospital was confronted with a different situation because the patient had become very restless and was in pain. Her condition had changed, and so a different standard of due care may then have been required than was required prior to the fall.

In view of the testimony above, said the court, even under an assumption that Mrs. Potter involuntarily rolled from her bed, the plaintiffs failed to prove negligence on the part of the hospital. But, continued the court, the hospital's defense was even stronger. Even if it be conceded that sideboards would have prevented the patient from involuntarily rolling from her bed, there was positive and uncontradicted testimony that at the time of her fall Mrs. Potter did not involuntarily roll from her bed but rather she was making a conscious and voluntary effort to leave her bed to go to the bathroom. It would seem, therefore, that the patient's fall and injury resulted from her own voluntary and conscious action and not from any negligent act of omission or commission on the part of the hospital.

Since there was no evidence to establish negligence on the part of the hospital, the Supreme Court held that the trial court should have directed a verdict for the hospital, and so it reversed the judgment in favor of the plaintiffs.—*Potter v. Dr. W. H. Groves Latter-Day Saints Hospital (Utah), 103 P. (2d) 280.*

Dental Practice Act (California): Self-Laudatory Advertising Not Unprofessional Conduct.—The appellant, Webster, who was licensed to practice dentistry in California, ran an advertisement in a newspaper praising the excellence of the "immediate restoration dentures," which he prepared for patients by "The Webster Way." These dentures, so the advertisement stated, were made according to a secret formula from "the newest plate material in dentistry," and they enabled the patient to have a "natural expression" which "defied detection" from any one. The advertisement in general stressed Webster's painstaking care, his skill and his success in this particular field of dentistry. On the ground that by running this advertisement Webster was guilty of unprofessional conduct in that (1) he had advertised professional superiority or the performance of professional services in a superior manner, (2) he had made use of advertising statements of a character tending to deceive the public and (3) he had advertised to guarantee dental services (any of which allegations, if proved, was sufficient cause for revocation of a license to practice dentistry under the California dental practice act), the Board of Dental Examiners suspended his license. Webster appealed to the courts and the matter eventually reached the district court of appeals, fourth district, California.

The question involved in this case, said the district court, is one of ethics, on which professional men have honest differences of opinion. But this court cannot determine ethical questions. It can determine only whether or not there has been a violation of the California dental practice act. In 1935, the California legislature joined other states in a movement to

make dentistry a more dignified and ethical profession and accordingly passed legislation regulating dental advertisements. The law so enacted in California, however, does not prohibit advertising entirely, as was done in some states, but sets up "some standard to regulate a limited form of advertising." There has been a marked tendency in recent years to enact more stringent regulations concerning the practice of law, medicine and dentistry, designed to protect the ignorant, gullible members of the public from quacks and charlatans, who spurn the ethics of their profession and thrive on ornate methods of advertising. However that may be, a statutory proceeding for the revocation of a license is in the nature of a criminal trial in which all intendments are in favor of the accused. In the absence of evidence that there has been violation of the law, the presumption is that the law has been obeyed.

We cannot here, continued the court, analyze each statement in the advertisement complained of. Some of the statements, when separately stated and technically construed, together with the inferences that may be drawn from them, may border on a violation of the dental practice act. However, it must be remembered that the truth of the statements set forth in the advertisement was not challenged by the board of dental examiners. Therefore, it can hardly be maintained (1) that they were of a character tending to deceive or mislead the public or (2) that they advertised a professional superiority or the performance of professional services in a superior manner or (3) that the advertisement was to guarantee any dental service. While we do not wish to condone any attempt to circumvent the spirit and intent of the law and open the field to quacks and charlatans, in view of the fact that disciplinary proceedings are of a criminal nature and that a license to practice dentistry is a property right of which the holder cannot be arbitrarily deprived, we must hold that the board of dental examiners has not met the burden imposed on it to establish by clear and convincing evidence the accused dentist's guilt, which must be done before his license to practice dentistry can be revoked or suspended.

The district court of appeals accordingly directed the board of dental examiners to reinstate the dentist's license to practice.—*Webster v. Board of Dental Examiners of California (Calif.), 103 P. (2d) 442.*

Malpractice: Liability of Hospital Association as Affected by Judgment for Professional Employee.—The plaintiff entered into a contract with the Industrial Hospital Association by which the latter, in consideration of a certain fee to be paid to it monthly, agreed to provide him with hospital, medical and dental services if and when necessary. Later it became necessary to extract one of the plaintiff's wisdom teeth and the Hospital Association directed him to go to Dr. Roberts, a dentist, who extracted the tooth. Infection which followed the extraction was due, the plaintiff alleged, to the dentist's negligence, and he sued both the Hospital Association and the dentist. At the conclusion of the plaintiff's evidence the trial court dismissed the suit as to the Hospital Association and later the jury returned a verdict in favor of the dentist, thereby, as the Supreme Court of Oregon said on appeal, "exonerating him [the dentist] from the charge of negligence." The trial court subsequently ordered a new trial as to the Hospital Association but not as to the dentist, and the Hospital Association appealed to the Supreme Court of Oregon.

The Hospital Association contended that the dentist was an independent contractor and that it had performed its obligations under the contract when it exercised due care in the selection of a dentist to render service to the plaintiff. The plaintiff contended that the dentist was an agent of the association and that the association was responsible for the dentist's negligence. Assuming, said the Supreme Court of Oregon, that the doctrine of respondeat superior applies, we are of the opinion that the verdict exonerating the dentist from the charge of negligence precludes recovery against the principal, the Hospital Association. The Hospital Association and the dentist were not joint tort-feasors. There was no independent act of negligence charged against the Hospital Association. If it is liable it can be so only by reason of the negligence of its agent, the dentist. When the judgment was rendered in favor of the dentist—from which there has been no appeal by the plaintiff—the foundation of any case against the association was destroyed. If the case were to be retried it would be incumbent on the plaintiff to show negligence on the part of the dentist, and that matter has been adjudicated adversely to the plaintiff's contention. The court then quoted from 2 American Jurisprudence 361, reading in part as follows:

> . . . where the tortious liability of the principal is based solely upon the act of his agent with whom he is being sued, a verdict in favor of the agent necessarily amounts to a finding that the principal also is not liable.

The Supreme Court accordingly reversed the order of the trial court granting a new trial as to the Hospital Association and ordered the trial court to reinstate the judgment of dismissal as to the association.—*Feazle v. Industrial Hospital Ass'n (Ore.), 103 P. (2d) 300.*

Dental Practice Acts: Statutory Restrictions on Advertising Upheld.—The dental practice act of Kentucky, enacted in 1938, provides that the state board of dental examiners may revoke a dentist's license for "unprofessional conduct." Certain activities are specified in the act as constituting "unprofessional conduct," among which is "advertising credit or terms of credit" extended by the practitioner to his patients. The plaintiff, a practicing dentist in Kentucky, filed a petition for a declaratory judgment to determine the validity of this provision in the dental practice act prohibiting "advertising credit or terms of credit." He contended that the prohibition against such advertising violated his constitutional rights under the state and federal constitutions. From a judgment sustaining the demurrer of the state board of dental examiners the plaintiff appealed to the Court of Appeals of Kentucky.

It was conceded, said the Court of Appeals, that the profession of dentistry and its practice are subject to the police power of the state and that the exercise of that power must be reasonable. Therefore, the only question before the court was whether or not the provision of the Kentucky dental practice act in question, which was enacted under the police power, reasonably affected or promoted public health, morals, safety or general welfare. In the opinion of the court it did. All dentists as well as physicians and members of other professions are not of equal capacity and the selection of the particular professional man to treat or represent the individual may, under the police power of the state, be regulated by considerations other than those purely economical. Persons of modest financial means and persons suffering from bodily ills are frequently not in a position to judge competently between the ability of different practitioners. Clearly, then, it was within the province of the exercise of the police power for the legislature to forbid any attempt to influence the public generally in the selection of a dentist through the medium of advertisements of credit and credit terms. The court was unable to differentiate between the damaging effects of advertising through paid agents and advertising by any other means through which patients, who perhaps would not have come but for the advertisement, are drawn to the office of the advertiser. The validity, said the court, of statutes prohibiting members of the dental profession from advertising for patrons in any form has been questioned frequently, but in every such instance the constitutionality of the statute has been upheld. While the court was unable to find a prior court decision involving a statute which specifically prohibited "advertisement of credit and terms of credit," in its judgment the same principles of law announced in the cases relating to prohibition of advertising in general by professional persons were applicable to the instant case, because "advertising credit or terms of credit" is nothing more nor less than an effort by which the practitioner seeks to bring patrons to his office through the advertised inducement of credit, on enticing and satisfactory terms.

The whole structure of the law in upholding legislation regulating the practice of members of any branch of the medical profession is based on the theory that a practitioner should not engage in any conduct smacking of quackery but should let his work prove and establish his worth, instead of "blowing his own horn" in an effort to bring about that establishment. Patients should seek the physician or dentist because of his capability, and not the physician or dentist obtain patients through their gullibility. The purpose of the legislature in

enacting the provision in question was, in effect, to prevent undue solicitation by dentists based on a financial appeal and to maintain a proper dignity and standard of professional practice in dentistry. These were clearly matters looking to the promotion of public health and general welfare. The authority so exercised by the legislature was the quintessence of police power, and no occasion speaks louder for its exercise and application than the proper regulation of those engaged in the delicate task of tinkering with the human body.

Accordingly, the judgment of the lower court upholding the constitutionality of the Kentucky dental practice act was affirmed. —*Reynolds v. Walz et al. (Ky.), 128 S. W. (2d) 734.*

Privileged Communications: Medical Report to Insurer; Cross-Examination of Witness.—An Oklahoma statute provides that the following persons shall be incompetent to testify:

> A physician or surgeon concerning any communication made to him by his patient with reference to any physical or supposed physical disease, or any knowledge obtained by a personal examination of any such patient: *Provided, that if a person offer himself as a witness, that is to be deemed a consent to the examination.*

In an action by the plaintiff, the insured, to recover sick benefits under an insurance policy, which covered appendicitis but not salpingitis, "a disease peculiar to women," the Supreme Court of Oklahoma held that the lower court had not erred when it refused to permit the defendant insurance company to introduce in evidence, through the insured's attending physician whom it had called as a witness, a preliminary report of the plaintiff's illness, which report had been furnished to the insurer by the attending physician without the plaintiff's knowledge or consent. This medical report included a statement that in addition to acute appendicitis the patient had bilateral salpingitis, which information was obtained by the attending physician during the course of his professional attendance on the plaintiff. In the opinion of the court this statement in the report was privileged under the privileged communications statute, and the privilege was not waived by the submission of the report to the insurance company as proof of the plaintiff's illness. Furthermore, in the judgment of the court, this privilege was not waived by the plaintiff when at the trial she testified, on cross-examination by the defendant's counsel, concerning her health in general. When a plaintiff, continued the court, offers herself as a witness in an action to recover for sick benefits under an insurance policy but does not voluntarily testify specifically or generally as to the cause of her illness, or the condition of her health prior thereto, she neither by offering herself as a witness nor by any averment in her petition waives her privilege under the privileged communications statute against the disclosure by her physician of any knowledge with reference to any physical or supposed physical disease which he obtained by personal examination of her. As is provided in the statute, the privilege may be waived only in the event that the patient offers herself as a witness and testifies "on the same subject." Merely answering questions as to treatments received by her physician, in response to questions on cross-examination, was not voluntary testimony on the part of the plaintiff and did not waive the privilege guaranteed by the statute. Accordingly, the judgment in favor of the plaintiff was affirmed.—*Massachusetts Bonding & Ins. Co. v. Jones (Okla.), 94 P. (2d) 885.*

Malpractice: Liability of Physician for Infection of Eyeball Following Surgical Removal of Cyst of Eyelid.—The plaintiff engaged the defendant, a physician but not a specialist in diseases of the eye, to remove a cyst from the "underside of her upper eyelid." He advised her that this could be done by a slight operation without causing pain or affecting her sight and that she would be cured in a short time. He everted the eyelid, made an incision and scraped out the cystic material with a curet. He then applied hydrogen peroxide and a 5 per cent solution of mild protein silver, placed a bandage over the eye and instructed the patient not to touch the bandage or her eye, to prevent infection. Thereafter he treated her daily for almost two weeks and then made arrangements for another physician to take over the case so that he might attend a physicians' meeting out of town. Up to the time he left he repeatedly assured the plaintiff that her eye was "doing nicely" and was not infected. At the trial, however, he admitted that three or four days prior to his departure he had observed a white cloudy circular ring in the iris of the plaintiff's eye "around the outer portion, which gradually grew cloudy and continued cloudy." The day after the defendant left, the plaintiff called the physician who was to take the defendant's place during his absence. He found the "entire eyeball completely inflamed," refused to treat it and sent the plaintiff to an eye specialist. In spite of treatments for a few days the condition of the plaintiff's eye became worse and the eyeball had to be removed. The plaintiff later brought suit against the defendant physician for malpractice. From a judgment in favor of the plaintiff the physician appealed to the court of appeals of Tennessee, middle section.

The defendant contended that the judgment was not supported by the evidence and that the trial court had erred in not directing a verdict in his favor. He further contended that the infection of the plaintiff's eyeball was the result of syphilis which she had contracted in 1931 and which had become arrested following her discontinuance of treatment before a cure had been effected. However, a Wassermann test for syphilis, taken during the course of the treatment of her eye, was negative. There was no evidence, said the court of appeals, that the defendant injured the plaintiff's eyeball in operating on her eyelid, and there was no evidence as to the cause of the inflammation of the eyeball. So far as the record showed, the plaintiff's eyeball may have become infected by her own fault in adjusting the bandages or in rubbing her eye, or it may have resulted from an "abscess caused by syphilis." But, continued the court, the lower court would not have been warranted in directing a verdict for the defendant on the proposition that he had exercised due care and skill in treating the plaintiff's eye after the operation on her eyelid. The defendant admitted that before he had turned the case over to the second physician he had observed a white ring "around the outer portion" of the iris which gradually became cloudy and remained cloudy. Both the other two physicians who attended the plaintiff were of the opinion that her eyeball had been infected for several days prior to the time of the defendant's departure from town. In the judgment of the court, the defendant evidently did not know or was negligent in not observing the infection when he assured the plaintiff that her eye was "doing nicely." It was therefore a question for the jury's determination whether or not the defendant in treating the eye subsequent to the operation had possessed and exercised that reasonable learning, skill and experience ordinarily possessed and exercised by members of the medical profession in good standing under similar circumstances. The court could find no reason to disturb the jury's finding that he had not. Accordingly, the judgment in favor of the plaintiff was affirmed. —*Glover v. Burke (Tenn.), 133 S. W. (2d) 611.*

Society Proceedings

COMING MEETINGS

American Academy of Pediatrics, Memphis, Tenn., Nov. 18-20. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.

American Society of Anesthetists, New York, Dec. 12. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

American Society of Tropical Medicine, Louisville, Ky., Nov. 12-15. Dr. E. Harold Hinman, Malaria Control Division, Wilson Dam, Ala., Secretary.

Pacific Coast Society of Obstetrics and Gynecology, San Francisco, Nov. 6-9. Dr. T. Floyd Bell, 400 Twenty-Ninth St., Oakland, Calif., Secretary.

Puerto Rico, Medical Association of, San Juan, Dec. 13-15. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.

Radiological Society of North America, Cleveland, Dec. 2-6. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Society of American Bacteriologists, St. Louis, Dec. 27-29. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Southern Medical Association, Louisville, Ky., Nov. 12-15. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 10-12. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Southwestern Medical Association, Tucson, Ariz., Nov. 21-23. Dr. M. P. Spearman, 1001 First National Bank Bldg., El Paso, Texas, Secretary.

Western Surgical Association, Topeka, Kan., Dec. 6-7. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

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Skin Grafting and Reconstructive Surgery. C. J. Thuss, Birmingham.—p. 77.
Maternal Mortality in Southern States: Factors Involved in Cause and Prevention of Increased Rate. E. D. Colvin, Atlanta, Ga.—p. 84.
Surgical Management of Ureteral Stones. E. B. Frazer, Mobile.—p. 94.
Treatment of So-Called Colitis with Sulfanilamide. J. W. Britton, Anniston.—p. 97.
Treatment of Acute State of Myocardial Infarction: Contraindications to Use of Morphine. T. K. Lewis, Birmingham.—p. 99.

American Heart Journal, St. Louis

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Characteristics of Chest Lead Electrocardiograms of 100 Normal Adults. D. Deeds and Arlie R. Barnes, Rochester, Minn.—p. 261.
Phonocardiographic Studies of Early Rheumatic Mitral Disease. A. C. Taquini, Buenos Aires, Argentina; B. F. Massell and B. J. Walsh, Boston.—p. 295.
Response to Renin of Unanesthetized Normal and Nephrectomized Rats. A. Freedman, Cincinnati.—p. 304.
Use of "Exercise Tests" in Connection with Venous Pressure Measurements for Detection of Venous Obstruction in Upper and Lower Extremities: Preliminary Report. J. R. Veal and H. H. Hussey, Washington, D. C.—p. 308.
Galvanometric Potentials of Extremities and of Thorax in Congenital Dextrocardia. C. E. Kossmann, New York.—p. 322.
Toxicity of Digitalis and Ouabain in Animals Under Sodium Thiopentobarbital and Sodium Pentobarbital Anesthesia. C. M. Gruber, V. G. Haury and M. E. Drake, Philadelphia.—p. 329.
*Incidence of Syphilitic Aortitis in Representative Municipal Hospital. A. Gelperin, Cincinnati.—p. 340.
Cardiovascular System in Pulmonary Tuberculosis. J. A. Sweeney, Philadelphia.—p. 345.

Incidence of Syphilitic Aortitis.—Gelperin studied the records of the 7,683 necropsies performed between 1926 and 1937 at the Cincinnati General Hospital. Microscopic evidence of syphilitic aortitis (excluding all developmental complications) was found in 700, or 9.1 per cent of the total. Variations in the incidence of syphilitic aortitis in necropsy groups depend on differences in the social status of the source population and on the number of Negroes who are included. Approximately 8 per cent of the white and 25 per cent of the Negro patients in a hospital caring for the indigent sick will have syphilis. By applying these percentages to the necropsy records studied by him the author finds that such a calculation shows that there should be 1,132 patients with syphilis (14.6 per cent). Since not all patients with syphilis have syphilitic aortitis, and estimations of its incidence vary from 50 to 90 per cent, an average figure of 70 per cent should give 792 cases of syphilitic aortitis, or 10.3 per cent. This predicted percentage is comparable to the actual incidence, which was 9.1 per cent. At least 1,200 patients with syphilitic aortitis are admitted to the Cincinnati General Hospital each year. The diagnosis of syphilitic aortitis therefore should merit more practical consideration than it has received. The problem might be solved by a better application of the knowledge of the pathologic changes of syphilis. Except during the relatively short early mucocutaneous infectious and late visceral stages, syphilis in its latent period is not moribund but smoldering and is slowly but surely destroying irreplaceable vital tissue. It is impossible to predict in whom it will develop and who will escape the disastrous developmental complications of syphilitic aortitis. Therefore it is suggested that "probable syphilitic aortitis" be added to each diagnosis of late latent syphilis in which previous treatment has been inadequate.

American Journal of Hygiene, Baltimore

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Section B

Host Range of Equine Encephalomyelitis: Susceptibility of North American Cottontail Rabbit, Jack Rabbit, Field Vole, Woodchuck and Opossum to Experimental Infection. J. T. Syverton and G. P. Berry, Rochester, N. Y.—p. 19.
*Immune Reactions of Carriers and Noncarriers of Type Specific Pneumococci: Bacteriologic and Immunologic Study of Hospital Contacts. M. Finland, J. W. Brown and Mildred W. Barnes, Boston.—p. 24.
Comparative Susceptibility of Different Strains of Mice to Rabies Virus. H. N. Johnson and C. N. Leach, Montgomery, Ala.—p. 38.
Canine Rabies Vaccination: Experimental Study of Efficacy of Single Subcutaneous Injection Method with Phenol Treated Vaccine. C. N. Leach and H. N. Johnson, Montgomery, Ala.—p. 46.

Section C

Human Intestinal Protozoa in Mexico. R. Hegner, E. Beltrán and R. Hewitt, Mexico City, Mexico.—p. 27.
*Study of Birds and Mosquitoes as Hosts for Virus of Eastern Equine Encephalomyelitis. W. A. Davis, Boston.—p. 45.

Section D

Studies on Schistosome Dermatitis: VII. Seasonal Incidence of Cercaria Stagnicolae Talbot, 1936, in Relation to Life Cycle of Its Snail Host, Stagnicola Emarginata Angulata (Sowerby). W. W. Cort, D. B. McMullen, L. Olivier and S. Brackett.—p. 33.
Occurrence of Adult Hookworms, Ancylostoma Caninum, in Lungs of Experimentally Infected Dog. G. F. Otto and Naomi Jaffe Schugam, Baltimore.—p. 70.
Transmission of Immunity to Trichinella Spiralis from Infected Animals to Their Offspring. Evelyn Abrams Mauss.—p. 75.

Immune Reactions of Pneumococcus Carriers and Noncarriers.—Finland and his associates carried out bacteriologic and immunologic studies on 126 interns, nurses, attendants, technicians and clinical clerks whose duties necessitated varying degrees of contact with pneumonia patients at the Boston City Hospital, where from 500 to 800 patients with pneumococcic pneumonia are treated each year. Bacteriologic studies were directed mainly to the isolation and identification of pneumococci from swabs from the tonsillar fossae and posterior pharyngeal wall. Pneumococci were identified on one or more occasions in seventy-one (56 per cent) of the 126 subjects. The percentage of carriers found appeared to be more or less proportional to the number of cultures made. Most of the patients who had pneumococci in their throat at the time of the first culture also had them in later cultures. These pneumococci were usually of the same type. Pharyngeal cultures were made of eighty-seven subjects either while they were having symptoms of acute respiratory infections or within a week after their subsidence. Pneumococci were found with about equal frequency in these cultures and in those when the subjects were free from respiratory infections. The distribution of types of pneumococci was similar in a general way to that found in most epidemiologic studies. Certain types of pneumococci, notably types I, VII, VIII, XIII, XVII and XXI, were more frequent than is usual among normal persons. Antibodies for homologous types were found frequently in carriers at the time when pneumococci were isolated. In a considerable number of the subjects the pneumococci were cultured before the corresponding antibodies were first demonstrated in the blood. In others, antibodies were present before the organisms were found in the pharynx. In many instances, antibodies persisted regardless of whether the carrier state continued or the organisms were no longer found. The association of antibodies in the serum with the finding of pneumococci in the pharynx was by no means constant in the transient or the chronic carriers. While it was difficult to trace direct exposures of carriers to patients infected with the same pneumococcus, there was indirect evidence of exposure to patients by some of the carriers of the less frequent types. More often the evidence pointed to exposure of the various carriers to one another rather than to patients. Pneumonia developed in four of the interns in the course of the study. These were not classic cases of lobar pneumonia and they do not shed much light on the relation of the immune mechanism to the inception of pneumococcic pneumonia. Two of the subjects were previously shown to be chronic pneumococcus carriers. The same type of pneumococci was found during the disease as was found previously and there was no significant change in the antibody status. The pneumonia of the other two interns was presumably transmitted from one to the other. In one a few type XVIII pneumococci were found during his illness; they were probably

incidental and their antigenicity could not be demonstrated. No pneumococci could be isolated from the cultures of the other intern during his infection, although he previously was a transient carrier of type XVII pneumococci. The predominant organism found during the acute illness of these two subjects was a slightly hemolytic streptococcus which was not fully identified. Their illness resembled that of atypical pneumonia, described recently as acute interstitial pneumonitis and sometimes loosely called "virus pneumonia" although a definite virus etiology has not been established. In none of the interns who had pneumonia did significant antibodies develop either to the pneumococcus which was found or to most of the common types associated with pneumonia. The observations lend further support to the antigenicity of type specific pneumococci in apparently healthy carriers, and those in the subjects in whom pneumonia developed indicate that pneumococci found in patients with atypical pneumonias may not be etiologically related to the infection.

Birds and Mosquitoes as Hosts for Encephalomyelitis Virus.—Davis investigated which mosquitoes native to Massachusetts were capable of transmitting eastern equine encephalomyelitis. Sixteen species of mosquitoes native to Massachusetts, including all the commoner members of the forty Culicinae known to the state, were obtained for study. In addition, Aedes aegypti was used as a control because it was already known to be a vector. The author also determined whether mosquitoes could become infected by feeding on wild birds, which may thus serve as a reservoir for the virus. He found that of the seventeen species of mosquitoes studied five (Aedes vexans, Aedes sollicitans, Aedes cantator, Aedes atropalpus and Aedes triseriatus) and a laboratory strain (Aedes aegypti) could transmit the virus of eastern equine encephalomyelitis from infected birds or mammals to other animals. No transmissions were obtained with the Culex, Mansonia and Anopheles genera of mosquitoes. Most mosquitoes of the genus Aedes probably can serve as vectors of the virus in the laboratory, but ecologic factors determine the importance of the different species in nature. If mosquitoes are the natural vectors of equine encephalomyelitis, Aedes vexans was probably the most important vector of the infection in the New England epidemic of 1938. Experimental evidence showed that birds (English sparrows, pigeons and cowbirds) could be infected with virus by the bite of infected mosquitoes and that such birds may serve as a source from which mosquitoes become infected. The results do not prove that birds are the natural reservoir of equine encephalomyelitis, but it is likely that mosquitoes which become infected with virus from such birds in turn infect horses, human beings, birds or other animals.

American Journal of Surgery, New York

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Further Observations on Treatment of Bursitis of Shoulder. R. L. Patterson Jr. and R. H. Patterson, New York.—p. 403.
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Surgical Treatment of Gastrointestinal Hemorrhage. L. K. Stalker, Rochester, N. Y., and H. K. Gray, Rochester, Minn.—p. 434.
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Acute Appendicitis in Diabetes Mellitus. A. Neiman, Chicago.—p. 443.
*Surgical Treatment of Acute Cholecystitis. H. K. Bonn and C. A. Bachhuber, Los Angeles.—p. 447.
*Meckel's Diverticulum. W. W. Noel, Detroit.—p. 454.
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Arteriosclerotic Gangrene: Major Clinical Problem. L. N. Atlas, Cleveland.—p. 467.
Adrenal Glands and Malignancy. B. Sokoloff and I. Arons, New York.—p. 471.
*Study of Sixty Cases of Tetanus. J. A. Kirtley Jr., Nashville, Tenn.—p. 480.
Local Asphyxia and Tumors. F. M. Allen, New York.—p. 484.
Spasmodic Torticollis: Its Cause and Treatment. J. T. Rugh, Philadelphia.—p. 490.
Surgery in Syphilitic Women. A. Philip, New York.—p. 496.

Surgical Treatment of Acute Cholecystitis.—From 1933 to 1938, 955 patients were admitted to the Los Angeles County Hospital with the diagnosis of biliary disease. Bonn and Bachhuber studied their records in an attempt to determine whether the elapsed time from the onset of an acute cholecystitis to operation had any influence on complications and mortality. The criterion was the pathologic diagnosis rather than the surgeon's operative report. The policy of the hospital has been to defer surgical intervention until the acute attack has subsided, subject to the indications for emergency operations at the discretion of the attending surgeons. The patient has been ill usually from two to seven days before entering the hospital. In the entire group of 955 cases there were 704 surgical interventions. Acute cholecystitis was diagnosed in 251 instances. Six cases had to be excluded because of insufficient data, leaving 245. None of this group were operated on and fifteen died. Nine necropsies were done, and in all but two instances the cause of death was other than acute cholecystitis or its complications. All necropsies showed the presence of a cholecystitis. As 230 of the 245 patients who were not operated on apparently recovered and were dismissed from the hospital in from five to fourteen days, there is presumptive evidence that the incidence of perforation, gangrene and abscess may not be as high as some observers report. The patients operated on have been divided into three groups: 1. Operation was performed within forty-eight hours of onset on sixteen patients; eight cholecystectomies and eight cholecystostomies, with three deaths, a mortality of 19 per cent. 2. Sixty-four patients were operated on from forty-eight hours to the seventh day after onset. There were five deaths, a mortality of 8 per cent. Forty-eight cholecystectomies were done with four deaths, and sixteen cholecystostomies were done with one death. 3. There were 427 operations performed after the sixth day of onset. The greater portion of this group were operated on from the fourteenth to the twenty-first day after onset, the majority on the fourteenth day. There were twenty-three deaths, a mortality of 5.4 per cent. Twenty deaths occurred among the 390 cholecystectomies performed and three deaths followed the thirty-seven cholecystostomies. The authors conclude that operation within forty-eight hours of onset carried too high a mortality to warrant much consideration, especially in the wards of charitable hospitals, whose patients are frequently poor surgical risks and who often do not come to the hospital within forty-eight hours of the acute onset. Therefore any early operation, preferably cholecystectomy, should be done within six to twelve hours of onset. The peak of the disease is probably reached in from one to four days. In group 2 the mortality had dropped by 60 per cent, from the 19 per cent of group 1 to 7.8 per cent in group 2. In group 3 evidence of acute active pathologic changes in the gallbladder was found in 130 of the 427 patients in whom the condition had supposedly subsided. The majority of the 130 patients showed minimal clinical manifestations when operated on. Yet the mortality dropped from 19 per cent in group 1 and 7.8 per cent in group 2 to 5.4 per cent in group 3. Nine deaths in group 3 were due to accidental injuries of ducts and blood vessels; if these deaths were eliminated the mortality would be 3.5 per cent. The frequent occurrence of acute pathologic changes in groups 2 (twenty-nine instances) and 3 does much to influence the authors' belief that no absolute time can be set as to the opportune moment to operate. Therefore each case should be conducted on a knowledge of Touroff's pertinent facts and be sharply individualized. Except for those cases of perforation and gangrene which may apparently occur at any time, the mortality percentage will probably be lowest when operation is done about fourteen days after onset.

Meckel's Diverticulum.—According to Noel, twenty-five cases of Meckel's diverticulum were encountered in 12,000 intra-abdominal operations performed at the Henry Ford Hospital during the last thirteen years. Seventeen of these occurred between the ages of 20 and 50 years. The extremes of life were a baby aged 14 weeks and a man aged 77. There were fifteen male and ten female patients; all were of the white race. The diverticula vary markedly in size, shape, position and structure. The majority were approximately the size of a thumb. Their position in relation to the ileocecal valve varied from 2 inches to 3 feet from the cecum. The majority of the diverticula lay free except for their attachment to the ileum. Thirteen of the patients presented no symptoms referable to the diverticulum. These patients were operated on for other conditions

and the diverticulum was an incidental finding. In the other twelve patients the symptoms depended on the pathologic involvement of the diverticulum. Six were associated with symptoms of intestinal obstruction, two suggested appendicitis, one bled from the umbilicus and three from the intestine. The preoperative impression was correct in only three cases. Treatment is always surgical intervention. The pathologic process resulting as a complication of the diverticulum must be given first attention, but the diverticulum should usually be removed. The diverticula reported were seen by seven different surgeons and treatment was of five different types. The technic for excision of the diverticulum is usually that used for the appendix. Resection of the intestine and inversion should be carried out only for special indications. Meckel's diverticulum should be looked for if the lesion found at operation is insufficient to account for the preoperative symptoms and signs. Two patients died: the 77 year old patient three days after operation and a woman of 56 from intestinal obstruction associated with a strangulated hernia. Only twenty of the twenty-five patients had any form of treatment directed to the diverticulum, giving a mortality rate of 10 per cent. The prognosis is good for complete recovery after the diverticulum is removed. Although the follow-up has been inadequate, none of the patients have returned for treatment for any cause associated with the diverticulum.

Tetanus.—Kirtley presents data on fifty-two cases of tetanus in the Vanderbilt University Hospital and eight cases in St. Thomas Hospital observed during the last fourteen years. There were thirty-two patients whose symptoms appeared within ten days after the initial injury (early tetanus) and twenty-eight whose symptoms occurred after more than ten days (late tetanus). The mortality among the early cases was 71.8 per cent and among the late cases 17.8 per cent. Puncture wounds of the extremities by nails, splinters, thorns and rake prongs were the commonest agents of injury. Lacerated wounds were the next most frequent. The mortality rate shows little change from year to year. During the first seven years of the study it was 45.8 per cent among twenty-four cases and in the last seven years 47.2 per cent among thirty-six cases. Three of the sixty patients received prophylactic injections of at least 1,500 units of antitoxin within twenty-four hours of the initial injury. Two of these patients died and one recovered. It is generally assumed that prophylactic antitoxin will prevent tetanus, but from 5 to 10 per cent of the patients with tetanus have had prophylactic antitoxin. The strongest evidence for prophylaxis is the 0.117 per cent of tetanus among more than two million wounded British soldiers who had received antitoxin. The debriding and irrigating of many of these war wounds may have also been a big factor in lowering its incidence. The incidence of tetanus has steadily decreased with each war as medical care and prophylaxis have improved. Comparable figures for tetanus in civil life are not available. The importance of incising the site of infection and removing all foreign material has been urged by many investigators. In the author's series some surgical procedure was instituted in seven cases with one death. Twenty-seven of the fifty-three patients whose wounds did not receive any surgical treatment died. The importance of wound care is again emphasized in the one patient who would have been expected to die but who recovered. This boy of 10 years cut his leg on a piece of glass and the wound was sutured at once. Three days later trismus and convulsions developed. The wound was reopened and irrigated, and wet dressings were applied. The child had a high temperature, tachycardia and all the unfavorable prognostic signs but recovered. The fact that failure to drain a localized infection containing tetanus bacilli may result in a fatality in spite of long incubation and survival periods and more than 200,000 units of antitoxin is shown by the following: A boy of 17 years injured his hand with a blank cartridge and a week later mild tetanus developed and he entered the hospital. Despite large daily doses of antitoxin he became progressively worse and died sixteen days after admission. Necropsy showed a palmar abscess containing powder granules, pus and tetanus spores. Twenty of the twenty-eight patients who died had wounds so located that incision or excision could have been done. Half of them died within twenty-four hours after admission, making it questionable whether any measure would have been of benefit. The other ten patients lived from two to sixteen days. It would seem desirable to incise the infected wound and convert it into an open wound in which anaerobiosis would be discouraged if not prevented. If further toxin formation can be prevented after hospitalization and the free, unfixed toxin neutralized, some of the patients who live four or five days may be saved. Antitoxin is best administered by the intravenous and intramuscular routes. The amount given seems to make little difference in mortality. Deaths were slightly less in the group receiving from 25,000 to 50,000 units in the first forty-eight hours. More than 43 per cent of the patients who died received more than 50,000 units within a few hours after admission. Avertin with amylene hydrate was given only those patients who had clonic convulsions; half recovered and half died. Phenol intravenously was given to seven patients, with two deaths. The two who died had short incubation periods, while those recovering had incubation periods of more than ten days. One patient with an incubation period of sixteen days received phenol alone and recovered.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

24:537-670 (Sept.) 1940

Occurrence of Positive Serologic Tests for Syphilis in Animals Other Than Man: Review of Literature. J. E. Kemp, Elsie Mae Fitzgerald and Mildred Shepherd, Chicago.—p. 537.
Aneurysm of Pulmonary Arteries. W. B. Allan and J. P. McCracken, Baltimore.—p. 563.
*Prognosis in Syphilitic Aortic Insufficiency: Evaluation of Factors Other Than Antisyphilitic Treatment. R. H. Kampmeier, Nashville, Tenn., and S. R. Combs, Terre Haute, Ind.—p. 578.
The Problem of Syphilitic Psychoses. E. Wexberg, New Orleans.—p. 590.
Sulfamethylthiazole and Sulfathiazole Therapy of Gonococcic Infections. J. F. Mahoney, R. R. Wolcott and C. J. Van Slyke, Staten Island, N. Y.—p. 613.
Treatment of Chancroid with Sulfanilamide. O. S. Culp, Baltimore.—p. 622.
Dependability of Skin Test in Diagnosis of Lymphogranuloma Venereum and Chancroid, Especially in the Colored Race. R. Brandt and R. Torpin, Augusta, Ga.—p. 632.
Cisternal Puncture: Survey of Reactions Following 1,246 Punctures. G. V. Kulchar, San Francisco.—p. 643.
Incidence of Cytoplasmic Inclusion Bodies in Vaginal Smears. Jean Broadhurst, Ruth Ewing, Marguerite LeMoyne and Estelle MacLean, New York.—p. 651.

Prognosis in Syphilitic Aortic Insufficiency.—Kampmeier and Combs studied the records of 163 patients with syphilitic aortic insufficiency in order to determine the part antisyphilitic treatment played in prolonging life. They also analyzed the relationship of congestive heart failure, free aortic regurgitation, sex and manual labor to longevity. Serologic tests for syphilis were positive in 139 cases and negative in twenty-three. Nineteen showed collateral evidence of syphilis and four presented no such evidence. Fifty-four and six tenths per cent died within the first three years after onset of symptoms and 19 per cent after three years; 11 per cent lived less than three years and 15.4 per cent survived this period. Practically all the patients were in the fifth decade of life. Of the group who died twelve, or 10 per cent, lived an average of 89.2 months and seventeen, or 39.5 per cent, of the living group survived an average of 112.8 months. The latter group had experienced symptoms for only about eleven months before coming under observation, whereas the former had symptoms for twice as long. The distribution of the dead and the living patients with relationship to race, sex and duration of life indicates that manual labor accelerates the progress of syphilitic aortic disease; 39 per cent of the patients who died within three years of the onset of symptoms were laborers and only 22 per cent of those who survived longer than three years were laborers. Two thirds of the ninety-one Negro men died within three years, fifteen died within a period of from thirty-seven to 138 months and only nine were alive from thirty-seven to 168 months after the onset of symptoms. Less than one half of the white men and Negro women died within three years, and about one fifth were alive from thirty-seven to 168 months after the onset of symptoms. There were only eight white women, but only two of these died within three years and one half were still alive from thirty-seven to 168 months after the onset of symptoms. Of those who died within three years 80 per cent were men, whereas after this

period men accounted for 67.7 per cent of the deaths. The aortic lesion was a chance finding among only twenty-five of the patients. Only fourteen of the 163 patients had had adequate treatment (at least eight injections of an arsenical plus twelve or more injections of heavy metal compounds or twenty-four or more injections of heavy metal compounds) in the past. Following the diagnosis of syphilitic aortic insufficiency only four of eighty-nine patients dying within three years and four of thirty-one dying in from thirty-seven to 138 months had received adequate treatment. Two of the latter group were women and lived seven and eleven years respectively. Likewise twelve of eighteen patients alive up to thirty-six months and twelve of twenty-five alive from thirty-seven to 168 months had received adequate treatment. Of the forty-three living patients eighteen were women, and one half of the twenty-four adequately treated patients were women. The data for the patients who died after twelve months from the onset of symptoms (others are not included) show that those who received inadequate treatment lived for 36.2 months as compared with 60.3 months for the adequately treated group. The duration of life of adequately treated Negro men was about equal to that of inadequately treated Negro women. Inadequately treated white men lived an average of 40 per cent longer than inadequately treated Negro men. Of twenty-two patients alive more than twelve months after the onset of symptoms, twenty-two have had adequate treatment and have lived on an average of 60.3 months. The seventeen who were inadequately treated have lived a total average of 80.6 months. Therefore the study does not indicate that adequate antisyphilitic treatment has a favorable influence on the prognosis of syphilitic aortic insufficiency. Of the 120 patients who died, twenty-nine died of other than a cause related to the heart.

Annals of Otol., Rhin. and Laryngology, St. Louis

49:577-864 (Sept.) 1940

Allergy of Upper and Lower Respiratory Tracts in Children. F. K. Hansel, St. Louis.—p. 579.

Study of Mortality Records Over Ten Year Period. F. T. Hill, Waterville, Maine.—p. 628.

*Use of Human Convalescent Scarlet Fever Serum in Streptococcic Infections Involving Ear, Nose and Throat. P. Viole, Los Angeles.—p. 639.

Pathology of Subepithelial (Reinke's) Layer of Vocal Cords. R. Waldapfel, Grand Junction, Colo.—p. 647.

Laryngocele Ventricularis. J. R. Lindsay, Chicago.—p. 661.

Survey of Relation Between Nutrition and the Ear. G. Selfridge, San Francisco.—p. 674.

Carcinomatosis of Nasal Mucous Membrane (Fatal Hemorrhage After Puncture of Maxillary Sinus). H. Brunner and J. W. Wall, Chicago.—p. 688.

Partial Saddle Nose: Simplified Technic Without Use of Implant or Transplant. M. M. Wolfe, Philadelphia.—p. 700.

Sulfathiazole Used with Cartilage Implants for Repair of Facial Defects. J. H. Childrey, San Francisco.—p. 709.

*Osteomyelitis of Frontal Bone: Report of Thirteen Cases. A. C. Jones, Boise, Idaho.—p. 713.

Selection of Treatment for Cancer of Larynx. H. E. Martin, New York.—p. 728.

Cavernous Sinus Thrombosis: Report of Three Cases with Autopsy Findings. H. W. Rubin and A. Cutler, Brooklyn.—p. 736.

Temporosphenoidal Brain Abscess with Operation and Recovery. W. L. McDougall, Atlanta, Ga.—p. 744.

Roentgen Therapy for Acute Sinusitis. H. L. Williams and W. C. Popp, Rochester, Minn.—p. 749.

Effect of X-Radiation on Tonsillar Tissue. C. I. Johnson, R. S. Palmer and L. A. Vance, Boston.—p. 755.

Convalescent Scarlet Fever Serum.—Viole used human convalescent scarlet fever serum for thirty-seven patients with streptococcic infection of the ear, nose or throat. Some of these were complications of scarlet fever or scarlatina. Of sixteen persons having otitis media and mastoiditis, nine required mastoidectomies. In four cases in which the serum was administered there was an immediate drop in temperature and lessening of the toxic symptoms with rapid, uneventful recovery. In seven the convalescence was slower but far better than might have been expected had the serum not been administered. The results were debatable in only four, as no demonstrable changes could be attributed to the serum. Only one of these sixteen patients died in spite of an injection of scarlet fever serum, which seemed to have no effect. Necropsy revealed that death was due to an acute streptococcic septicemia. Eight of the thirty-seven patients received sulfanilamide in addition to the serum. It made little if any difference in the course of the disease and the patient's recovery. However, in the presence of a grave illness neither should be denied if indicated. There were five cases of streptococcic meningitis secondary to mastoiditis in which surgical intervention was performed. Two of these patients improved immediately after receiving the serum, although one had been receiving sulfanilamide without much effect. Convalescence was uneventful and the results were excellent. A third patient showed some immediate improvement but a large abscess developed in the left buttock at the site of the intramuscular injection of the serum. Her progress was retarded until the abscess was opened and drained. The two remaining patients of this group received sulfanilamide in addition to serum. One made an uneventful recovery. The other improved slowly, but four days after she had been discharged from the hospital a diagnosis of scarlet fever was made. The value of the serum may be considered questionable. Another patient immediately after mastoidectomy on the left side with ligation of the jugular vein received 40 cc. of scarlet fever serum and his temperature dropped to normal, where it remained for four days, when it rose suddenly to 105 F. The mastoid wound was reopened but no pathologic change was found. Two subsequent injections of serum, 20 and 40 cc. respectively, failed to elicit any response and the patient died. There were four cases of laryngotracheobronchitis and three of streptococcic pharyngitis. Three tracheotomies were performed. The rate of recovery and definite signs of improvement were much slower in three patients who were given sulfanilamide in addition to the serum. The others who received only serum, except one on whom a tracheotomy had been performed, improved immediately. The author states that the most dramatic improvement following serum occurred among five cases of streptococcic sore throat, definitely placing streptococcic sore throat among the curable diseases. In the series there was a retropharyngeal abscess with complicating cervical adenitis, toxic anemia, Ludwig's angina and otitis media. In spite of injections of serum this patient's progress was slow until the abscess was opened and drained, when the convalescence was rapid and uneventful. This emphasizes the benefits of early treatment. One instance of beginning peritonsillar abscess responded well to scarlet fever serum and the patient improved without surgical intervention. On the other hand its value in a case of cervical adenitis was questionable. The patient also received sulfanilamide and, though her convalescence was uneventful, it was decidedly slow. There was only one reaction to the serum. This patient had a long history of allergy to various things and entered the hospital with asthma, cervical adenitis and pneumonia complicating scarlet fever. Urticaria developed after 40 cc. of the scarlet fever serum, and no more was given. After adequate doses of sulfanilamide she recovered. Human convalescent scarlet fever serum produces no foreign protein reactions and sensitizations as does animal serum, and such reactions as may occur are easily controlled.

Frontal Bone Osteomyelitis.—Jones reports thirteen cases of osteomyelitis of the frontal bone and emphasizes the necessity for early diagnosis. He stresses the fact that swelling, edema and pain over the frontal sinus are of more value than a roentgenogram, as the infection is existent from seven to ten days before there can be x-ray evidence of it. Two of the author's cases followed injury and were not connected with sinus infection, four presented intracranial involvement and seven did not. He does not think that any definite operative procedure can be followed in these cases. It is not necessary to block off and remove a whole area of the frontal bone because the diploic spaces are tortuous. The operative procedure which he uses follows along the diploic spaces. The incision should be sufficiently large to uncover a large amount of bone for inspection, and bone removal should extend laterally far enough to reach the outer limit of the frontal sinuses. He has secured good results by more conservative incisions than that from eyebrow to eyebrow and splitting up the middle of the forehead. He has used the hairline incision as brought out by Furstenberg with almost no visible scarring, being careful to preserve the periosteum. With plenty of assistance in elevating the scalp, an excellent view can be obtained of the questionable area. This incision also leaves little scarring. The end results in his cases

indicate that the enormous disfiguration caused by keeping the flaps separated during the healing is not necessary. He concludes from a rather incomplete survey of the literature and his observations that generalized osteomyelitis is often inexcusably overlooked.

Archives of Ophthalmology, Chicago

24:627-866 (Oct.) 1940

After Half a Century of Cataract Extraction. C. B. Meding, New York.—p. 627.
Tubercle Within Central Retinal Vein: Hemorrhagic Glaucoma; Periphlebitis Retinalis in Other Eye. F. H. Verhoeff, Boston, and G. V. Simpson, Washington, D. C.—p. 645.
Grenz Rays and Their Application in Ophthalmology: I. Their Properties of Penetration. P. Dethmers and P. H. Boshoff, Leiden, Netherlands.—p. 656.
Value of Tryparsamide in Treatment of Atrophy of Optic Nerve Due to Syphilis. H. Sutherland-Campbell, Los Angeles.—p. 670.
Intracellular Bodies of Conjunctival Epithelial Cells. A. Braley, Detroit.—p. 681.
Hypertelorism. M. L. Berliner and S. Gartner, New York.—p. 691.
*Clinical Studies of Vitamin A Deficiency: Biophotometer and Adaptometer (Hecht) Studies on Normal Adults and on Persons in Whom an Attempt Was Made to Produce Vitamin A Deficiency. Bertha L. Isaacs, F. T. Jung and A. C. Ivy, Chicago.—p. 698.
Fundamental Differences Between Crossed Cylinder and Line Chart Astigmatic Tests. J. I. Pascal, New York.—p. 722.
Orbital Apex and Sphenoid Fissure Syndrome. Helen Holt, Chicago, and A. de Rötth, Spokane, Wash.—p. 731.
*Unusual Changes in Retinal Veins in Diabetes. C. S. O'Brien and J. H. Allen, Iowa City.—p. 742.
Ocular Pharmacology of Furfuryl Trimethyl Ammonium Iodide, with Special Reference to Intra-Ocular Tension. A. Myerson and W. Thau, Boston.—p. 758.
Effect of Iontophoresis on Eye, with Special Reference to Intra-Ocular Tension. W. Thau and A. Myerson, Boston.—p. 761.
Choroidal "Perithelioma" Simulating Retrobulbar Neuritis: Report of Case. B. Friedman, New York.—p. 765.
Encanthis Trachomatosa. E. Oláh, Gyula, Hungary.—p. 772.
Results Achieved by Orthoptic Training in Correction of Strabismus. Clara Burri, Chicago.—p. 784.
Lines on Bulbus Beneath the Conjunctiva. E. Oláh, Gyula, Hungary.—p. 792.
Allergic Phenomena in Ophthalmology. A. Appelbaum, New York.—p. 803.

Vitamin A Intake and Biophotometer Readings.—Isaacs and her associates examined 143 healthy medical students in an endeavor to correlate their vitamin A intake with their biophotometer readings. Twenty of the subjects had ten consecutive daily readings in order to determine their day to day variations and the variations between different persons. The authors present the results of their attempts to produce a disturbance of vitamin A absorption and dark adaptation by giving large doses of liquid petrolatum to twenty-eight students (using twenty-nine others as controls), a disturbance of dark adaptation by a vitamin A deficient diet in three students and the response of patients to vitamin A. The biophotometer readings of the twenty students chosen for intensive study and of the other 123 tested showed frequent wide daily variations and also that a subject might appear deficient one day and normal on all ensuing days. In the experiment in which 5 cc. of liquid petrolatum per kilogram of body weight for as long as 131 days was used to impair vitamin A absorption the biophotometer did not detect any correlation between the dietary vitamin A of these or of normal subjects, their biophotometer performance and possibly presumptive clinical signs of hypovitaminosis A. Supplements of oil concentrates providing for several months 200,000 units of vitamin A and 2,700 units of vitamin D daily produced no apparent change in any of the subjects. The three subjects who lived on a diet containing not more than 74 U. S. P. units of vitamin A for forty-three, forty-nine and forty-nine days, respectively, failed to show more than a suggestion that their stores of vitamin A were being depleted as determined by dark adaptation levels. Subjective symptoms suggestive of a possible temporary hypovitaminosis were reported on the fourteenth and sixteenth day respectively by two of the subjects. The results are interpreted to indicate failure to produce definite evidence of deficiency after forty-nine days of a diet containing 74 units of vitamin A. The authors believe that their subjects must either have had large stores of vitamin A, were unsusceptible or that it takes a long time to manifest definite evidence of deficiency. In view of their results and the fact that several observers have reported a probable general vitamin A deficiency amounting in some areas to as high as 52 per cent, it occurs to them that (1) the average American diet may be deficient in available vitamin A or its precursors, (2) the standard of vitamin A intake on which subjects are judged to be deficient is questionable and (3) the procedures being used for measurement are recording something other than vitamin A deficiency. They incline toward a combination of the latter two possibilities. It is their opinion that subjective factors involved in the determinations of all types of visual tests should be recognized and an attempt be made to control them when measurements of dark adaptation levels are made; also that significance should not be attached to minor fluctuations in dark adaptation in terms of vitamin A deficiency unless statistical methods are used to test the reliability and validity of the differences.

Retinal Veins in Diabetes.—Ophthalmoscopic examinations of several hundred diabetic patients, according to O'Brien and Allen, have revealed many with typical retinitis. Almost invariably sclerosis of the retinal vessels was in evidence and occasionally varices of the retinal veins were observed. These venous changes occurred almost exclusively in patients with diabetes and arteriosclerosis, but occasionally they were present in those with arteriosclerosis alone. Most frequently the varices were found in those with poorly controlled, long-standing diabetes. From the literature, in which eight cases are reported, it appears that varicosities of the retinal veins are rare and apparently occur almost exclusively in adults with poorly controlled diabetes and arteriosclerosis. The authors cite twenty-one patients from 36 to 65 years of age having diabetes with retinitis and retinal varices, who showed symptoms of diabetes for from two to twenty-five years, with an average of ten years. The diabetes was poorly controlled in every instance. The systolic blood pressure ranged from 108 to 240 mm. of mercury and the diastolic pressure from 65 to 110 mm. On physical examination nineteen of the twenty-one patients were found to have generalized arteriosclerosis and five showed nephrosclerosis. Nine patients had enlargement of the heart and five had coronary disease. Other complicating conditions (gangrene, ulcers, edema) were encountered. The vision of sixteen patients was diminished. In every case the retinal vessels were sclerosed and hemorrhages were seen in the retina. In all but one, small sharply marginated, yellowish white areas of retinal degeneration were present. Woolly areas of cytoid degeneration were observed in fifteen patients, proliferating retinitis was seen in one or both eyes of nine patients and hemorrhages in the vitreous were present at some time in three. All these patients showed varicosities, most frequently in the larger retinal veins. They did not appear to have any relation to arteriovenous crossings. In some eyes the varices alone gave evidence of venous changes, but in others a white line along either side of the vessel gave proof of sclerosis. Frequently the affected vein showed constrictions of the lumen alternating with varices, thus giving a beaded or sausage-like appearance. In five cases venous thrombosis was present in either the central vein or one of its branches. Under the microscope the veins of an eye with secondary glaucoma removed from one of these patients appeared sclerosed, the wall showing variations in thickness, hyaline degeneration, endothelial proliferation and thromboses. Varices in the retinal vessels were observed in considerably less than 1 per cent of patients with diabetic retinitis. Retinitis of diabetes is not perhaps the best term for the condition and retinosis is suggested.

California and Western Medicine, San Francisco

53:105-152 (Sept.) 1940

Interpretation of Laboratory Examinations in Diagnosis of Infectious Diseases: Part I. C. S. Keefer, Boston.—p. 111.
The Middle Road in Obstetrics and Gynecology. J. N. Ewer, Oakland.—p. 114.
Pneumonia in Children: Treatment with Sulfapyridine. E. E. Moody and E. G. Knouf, Los Angeles.—p. 116.
Polypoid Bronchial Tumors, with Special Reference to Bronchial Adenomas. A. Goldman, San Francisco.—p. 123.

Connecticut State Medical Journal, Hartford

4:501-584 (Sept.) 1940

Organization of Medical Services for the Care of Civilians Injured in Air Attacks. E. Hoff, Oxford, England.—p. 501.
Health for Pupils and Teachers. I. V. Hiscock, New Haven.—p. 509.
Medical Preparedness in Connecticut. C. Barker, New Haven.—p. 513.
Recent Advances in Chemotherapy. J. Millett, Hempstead, N. Y.—p. 515.

Journal of Lab. and Clinical Medicine, St. Louis

25:1235-1358 (Sept.) 1940

*Sulfapyridine: Studies on Absorption and Excretion. J. M. Kinsman, J. W. Moore and M. M. Harrison, Louisville, Ky.—p. 1235.

Studies of Sulfanilamide in Blood and Urine of Rabbits Infected with Beta Hemolytic Streptococci. L. Hansen and W. A. Kreidler, Philadelphia.—p. 1246.

Calorigenic Action of Ammonium Salts in the Human Subject. R. C. Herrin, Madison, Wis.—p. 1259.

Toxic Effects of Sulfanilamide on Tissues of Rats. H. A. Davis, L. C. Harris and H. C. Schmeisser, Memphis, Tenn.—p. 1263.

Accuracy of Diagnosis of Appendicitis. A. S. Arkush and A. A. Kosky, Santa Monica, Calif.—p. 1276.

Stability of Ascorbic Acid in Blood. L. D. Greenberg and J. F. Rinehart, San Francisco.—p. 1288.

*Treatment of Acute Attacks of Bronchial Asthma by Intravenous Injection of Aminophylline. H. A. Carr, New York.—p. 1295.

Note on Determination of Total Serum Proteins, Serum Albumin and Serum Glo' 'in. Ida Kraus, Chicago.—p. 1300.

Simple Aid Making Blood Smear. B. Sills, Mexico City, Mexico.—p. 1302.

Evaluation of Methods for Determining Blood and Urinary Amylase. D. L. Dozzi, Philadelphia.—p. 1303.

Rapid Diagnosis of Malaria from Thick Blood Smears. G. Castro, Panama, Republic of Panama.—p. 1308.

Determination of *p*H Values of Biologic Fluids: II. Influence of Temperature, Dilution and Type of Diluent on *p*H Values of Bacteriologic Mediums. A. Glaubiger, New York.—p. 1311.

Procedure for Routine Determination of Vitamin B_1 in Urine. J. W. Ferrebee and G. A. Carden, New York.—p. 1320.

Measurement of Cell Volume of Blood by Cell Opacity Method. A. T. Shohl, Boston.—p. 1325.

Absorption and Excretion of Sulfapyridine.—Kinsman and his co-workers have given sulfapyridine to 131 patients. The concentration of the drug in the blood, its absorption and its elimination have been studied in forty-six cases (thirty-eight of pneumonia, one of empyema, one of gonococcic arthritis, one of typhoid and five of Streptococcus viridans endocarditis). The drug was administered orally. Absorption was erratic, the height of the absorption curve was unpredictable from identical doses and from patient to patient, and there was no correlation between the size of the dose and the height of the blood concentration curve. Generally the blood concentration was higher following a dose of 2 than of 4 Gm. About 60 per cent of the patients vomited. Vomiting was more frequent after an initial dose of 4 than of 2 Gm. Therefore the routine employment of an initial dose of 2 Gm. is recommended. The cause of the vomiting was not clarified but the authors feel that it is of central and not of gastric origin. It is not due to an increased concentration of the acetylated form of the drug, for among the patients who vomited this form of the drug was much lower than in the ones who did not vomit. Acetylation or conjugation of the drug occurred rapidly, about 35 per cent of it being acetylated within the first hour. Throughout the course of administration about 33 per cent of acetylation is present, although it varies from 0 to 100 per cent. During elimination acetylation is much greater than at any other time. No evidence was found that the degree of acetylation bears any relation to the total concentration of the drug in the blood. After the drug is withdrawn it is at first eliminated rapidly, then more slowly, so that as long as five days later appreciable quantities can still be found in the blood and urine. The free form is eliminated more rapidly than the acetylated form. The drug disappears from the urine at about the same time as from the blood. Quantitative determinations show that from 21 to 56 per cent of the drug can be recovered from the urine, the average being 30 per cent. The authors conclude that, in order to ensure the maximal recovery rate, frequent blood concentration studies should be made of every patient with pneumonia (103 of their whole series had pneumonia, six of them died) and if the patient does not seem to be doing well and the blood concentration is below 6 mg. per hundred cubic centimeters the drug or its sodium salt should be administered parenterally. Only 40 per cent of the patients with bacteremia recovered with a blood concentration less than 6 mg. per hundred cubic centimeters, whereas under the same conditions 70 per cent of patients with a negative blood culture recovered.

Aminophylline for Bronchial Asthma.—From July 1938 to May 1939, according to Carr, forty-one patients with acute bronchial asthma were treated at Bellevue Hospital. Twenty-two of these were refractory to epinephrine and their acute attacks were treated by intravenous injections of aminophylline. The aminophylline was given undiluted, 0.48 Gm. in 2 cc. of aqueous solution. The entire amount was administered intravenously within two minutes. About a third of the patients showed one or more of the following symptoms: dizziness, nausea, retching, vomiting, "pounding of the head," "burning in chest and head" or head and chest pain. No alarming effects were observed, and neither did striking or permanent effects of pulse or blood pressure ensue. The duration of disease varied from one to twenty years. Half of the patients obtained immediate relief. The effect in others was evident in from five to thirty minutes. The duration of benefit was from one hour to the absence of a recurrence over a period of days. It was never necessary to give more than one injection within a period of less than two hours. The effectiveness of epinephrine may have been restored in view of the fact that half of the patients required only one injection, were subsequently discharged and apparently did not have another refractory attack. Eight of the twelve patients who received intravenous injections of aqueous solution of aminophylline for acute asthma without a history of its previous use obtained immediate and striking relief, and four obtained relief within ten minutes. Minor toxic symptoms occurred among one third of the patients. All stated that they experienced greater relief than that given by epinephrine during previous acute attacks. Eight patients who had been given epinephrine by the ambulance surgeon or admitting physician were all benefited when aminophylline was given from twenty-five minutes to twenty-four hours later. Three had immediate relief and the others obtained relief in from twenty to fifty minutes. Three had minor toxic symptoms. Two patients had asthma of an allergic type, and these two responded less favorably.

Journal-Lancet, Minneapolis

60:379-432 (Sept.) 1940

Nature of Various Mill Dust Allergens. F. W. Wittich, Minneapolis.—p. 418.

Capsella Bursa Pastoris as Hemostatic After Prostatectomy. A. J. Greenberger and M. E. Greenberger, New York.—p. 422.

Journal of Urology, Baltimore

44:247-388 (Sept.) 1940

Stenosis of Ureteropelvic Juncture: Congenital and Acquired. H. J. Jewett, Baltimore.—p. 247.

Malignant Papillary Cystadenoma of Kidney: Case Report. W. G. Hayward, Jamestown, N. Y.—p. 259.

Tests for Leakage in Early Diagnosis of Ruptured Bladder: Use of Cystometrogram. H. M. Weyrauch Jr. and R. A. Petery, San Francisco.—p. 264.

Vesico-Appendical Fistulas. J. deJ. Pemberton, T. L. Pool and J. M. Miller, Rochester, Minn.—p. 274.

Suprapubic Transvesical Repair of Vesicovaginal Fistulas. I. J. Farsht, Minneapolis.—p. 279.

Interstitial Cystitis: Report of Case with Necropsy. J. Schwartz and D. Kastoff, New York.—p. 301.

Tumors of Penis. W. J. Carson, Milwaukee.—p. 307.

Malignant Mixed Tumor of Spermatic Cord (Lipo-Osteofibrosarcoma). M. L. Dreyfuss and S. Lubash, New York.—p. 314.

Ectopic Testis: Report of Case of Bilateral Ectopia Testis Pelvicis and Its Surgical Correction. R. W. Hunt, New York.—p. 325.

*Embryoma of Testis: Report of Case and Classification of Neoplasms of Testis. M. M. Melicow, New York.—p. 333.

*Studies in Malignant Testis Tumors: II. Syndrome of Choriogenic Gynecomastia: Report of Six Cases and Review of 121. J. B. Gilbert, Schenectady, N. Y.—p. 345.

Leukoplakia of Urinary Tract: Report of Unusual Case of Leukoplakia of Ureter. V. C. Laughlin and J. F. L. Bilotta, Cleveland.—p. 358.

*Treatment of Gonorrhea with Sulfathiazole. O. S. Culp, Baltimore.—p. 367.

Complications from Sulfanilamide Therapy of Urinary Tract Infections. R. J. Prentiss and R. H. Flocks, Iowa City.—p. 377.

Experimental Study of Anesthetic and Analgesic Properties of Pyridium. J. H. Morrissey and A. N. Spinelli, New York.—p. 381.

New Ureterostomy and Urethral Catheter Retainer. J. H. Winer, Staten Island, N. Y.—p. 386.

Embryoma of Testis.—Melicow reports an embryoma of the testis the microscopic picture of which he interprets on the basis of pathologic embryology. The patient, 28 years of age, presented a hard, painless, nontransilluminating mass in the right side of the scrotum. The condition had been present for four months. The Aschheim-Zondek test was strongly positive. A right orchidectomy was performed. The immediate recovery was uneventful, but the Aschheim-Zondek test

remained strongly positive. Bilateral gynecomastia and pulmonary metastases developed and caused hemoptysis. The patient died three months after the operation. The gross specimen presented areas of hemorrhage and necrosis within a relatively solid grayish pink tumor. Scattered among dense collections of variegated cells were a number of simple ring-like structures composed of ovoid cells characterized by an inner cell mass. The latter resembled the blastula stage of mammalian embryos. A count of the embryo-like buds in any one slide, when compared with the size of the specimen, indicates that the tumor probably contained millions of such structures. The blastula stage was seen often. In a few embryonic buds there was a suggestion of the formation of the notochord and splitting of the mesoderm to form the celomic cavity. Masses of syncytial cells resembling the chorionic epithelium seen in pregnancy were irregularly distributed throughout the specimen. This observation, plus the intense chorionic gonadotropic reaction and the gynecomastia, the author believes, support the conclusion that the tumor dealt with is one containing numerous embryos of varying stages of development. The blastulas were the youngest ever seen in the human being.

Malignant Testis Tumors and Gynecomastia.—Gilbert cites six cases of malignant testis tumors associated with gynecomastia and data on 129 cases from the literature. The study includes clinical examination for sperm in two cases, and differential qualitative determination of gonadotropic hormone output on hypophysectomized rats. The four other unpublished reports are personal communications. He divides the total of 135 cases of gynecomastia into two groups. Group 1 includes 103 cases associated with teratoid tumors. There were fifty-four primary testicular tumors, seven so-called extragenital chorionepitheliomas, eleven apparently misdiagnosed chorionepitheliomas and thirty-one teratoid tumors with a clinical course strongly suggesting the presence of chorionepitheliomatous elements. Group 2 comprises twenty cases which were eliminated from discussion in the group of true choriogenic tumors with gynecomastia. The mammary stimulation was nonfunctional and not related to the testis tumor. The characteristics of the syndrome of choriogenic gynecomastia with testis tumors consist of (1) chorionepithelioma in the primary or metastatic tumor, (2) gynecomastia, usually bilateral, with glandular tissue hyperplasia, often the only symptom present, (3) enlargement and/or hyperpigmentation of the areolas, (4) physiologic activity manifested by either gross or microscopic secretion in the breasts, (5) high titers of choriongonadotropic hormones and the presence of estrogen, (6) histologic changes in the pituitary gland described generally as "pregnancy cells" and (7) hyperplasia of the prostate and/or seminal vesicles.

Sulfathiazole Treatment of Gonorrhea.—Culp used sulfathiazole in the treatment of thirty-eight male patients with gonococcic urethritis. Twenty-one of these have been followed regularly since the drug was discontinued and seventeen of them have had no recurrence to date and appear to be cured. There were two frank failures and one recurrence. Anemia developed in one patient and he was unable to tolerate sulfathiazole. Six of the seventeen apparent cures were of patients with both anterior and posterior urethritis, some of which had further complicating manifestations of gonorrhea. Two of the cured patients had failed to improve on sulfanilamide. Most of the patients received 1 Gm. of sulfathiazole every six hours for an average of 9.3 days. The discharge disappeared on an average of 2.7 days in those patients in whom it was limited to the anterior urethra and on an average of 5.2 days when complications were present. Eight of the thirty-eight patients appeared to be well but failed to return after sulfathiazole was discontinued. The dosage and duration of their treatment was about the same as in the well followed cases. Urethral discharges disappeared on an average of 2.8 days, and all the patients were free from gonococci when last seen. The remaining nine patients have had disappearance of their discharge and their urethral cultures are negative, but they are still taking the drug. Six of these had posterior involvement and three involvement limited to the anterior urethra. In the latter group the discharge disappeared in two days and in the complicated cases the duration of exudate averaged 4.7 days. Only two instances of toxicity (one of anemia and one of leukopenia) were encountered, although the blood and urine of every patient were analyzed frequently. The best results were obtained with those patients who received 1 Gm. of sulfathiazole every six hours until the voided urine was free from shreds. To avoid urolithiasis and leukopenia the fluid intake was intentionally not reduced. The blood level of sulfathiazole only once reached 4 mg. per hundred cubic centimeters. Generally it was between 2.5 and 3.5. A higher blood concentration of the drug does not appear necessary and limitation of fluids should be avoided. Sulfathiazole apparently is of great value in the treatment of acute gonorrhea (posterior and anterior) and it compares favorably with other sulfonamide derivatives.

Medical Bull. of Veterans' Adm., Washington, D. C.

17:111-214 (Oct.) 1940

Biopsy of Sternal Marrow and Its Place in Clinical Hematology. H. C. Manaugh.—p. 111.
Valvular Heart Disease in Pulmonary Tuberculosis. H. K. Stinson.—p. 122.
*Therapeutic Methods in Neurosyphilis. C. L. Carlisle and U. S. Bowen.—p. 125.
*Sobisminol Mass in Treatment of Syphilis. E. A. McClintock.—p. 129.
*Optic Nerve Damage in Luetic Patients. C. E. Johnson.—p. 133.
Study of Peptic Ulcer in Chronic Psychosis. S. Rosenbliett and L. Manley.—p. 136.
Effect of Abuse of Alcohol on Electrical Activity of Heart. O. K. Timm.—p. 142.
Treatment of Pneumonia. J. R. Boswell and T. E. Dredge.—p. 145.
Typing, Prophylaxis and Treatment of Pneumonia. J. E. Faingold.—p. 150.
The Veterans' Administration Facility for Negro Beneficiaries, Tuskegee, Ala. E. H. Dibble Jr.—p. 158.
Library Activities at Tuskegee. Sadie P. Delaney.—p. 163.

Treatment of Neurosyphilis. — The efficacy of chemotherapy, particularly sobisminol mass developed by Hanzlik, following hyperpyrexia for the treatment of neurosyphilis is discussed by Carlisle and Bowen, by McClintock and by Johnson. Carlisle and Bowen point out that hyperpyrexia induced by malaria or short wave diathermy should be complemented by chemotherapy, as it is unlikely that pyrexial therapy ranging from 104 to 107.6 F. will uniformly and for long enough heat all the tissues of the body to this spirocheticidal point. Therefore they believe that chemotherapy should take care of any spirochetes which escaped the spirocheticidal effects of the heat. For this McClintock believes that sobisminol mass orally is indicated, as the daily urinary bismuth excretion level at from 3 to 5 mg. necessary for effective spirochetal destruction is easily maintained by its continued administration. This has been shown by various investigators. This level of excretion was easily maintained for the four patients treated at the Veterans' Administration Facility at Palo Alto, Calif., by the daily oral administration of 900 mg. of sobisminol mass for as long as eight weeks. Mild toxic symptoms, nausea, vomiting, grip, stomatitis, anorexia and a bismuth line do occur but did not in their patients. However, the toxicity is immediately relieved when the drug is discontinued. Because of toxic symptoms treatment with sobisminol mass had to be discontinued permanently with four and temporarily with seven of ninety patients treated by Scholtz, McEachern and Wood. Johnson discusses the incidence of optic nerve damage, and toxic amblyopia as by-effects of tryparsamide treatment of neurosyphilitic patients. He recommends routine ophthalmologic examination of the neurosyphilitic patient on admission to the hospital, as these will make subsequent comparisons possible. It has been stated by Moore that if any visual impairment is to occur it will appear by or before the fifth weekly injection of tryparsamide. If no impairment is apparent by the twelfth injection the drug may thereafter be administered with impunity. All patients should be cautioned to report any visual disturbance following tryparsamide therapy. Regardless of how psychotic the patient may be, any report of a visual change should be heeded and acted on immediately. At this time probably no changes will be apparent in the disk head provided treatment (hyperpyrexia and chemotherapy) for the neurosyphilis was instituted fairly early. Field changes must now be relied on and if present and tryparsamide is discontinued it is usually possible to arrest the optic process.

Michigan State Medical Society Journal, Lansing

39:613-728 (Sept.) 1940

Common Lesions of Vulva. F. J. Taussig, St. Louis.—p. 637.
Fungi: Relation to Respiratory Allergy: Air Survey in Southern Michigan. G. L. Waldbott, M. S. Ascher and A. B. Ackley, Detroit.—p. 645.
Addison's Disease: Recent Contributions to Treatment. W. O. Thompson, Chicago.—p. 648.
Brill's Disease: Report of Case. D. M. Gordon, Detroit.—p. 653.
Ophthalmology: Recent Advances. S. R. Gifford, Chicago.—p. 655.
Pregnant Diabetic Women: Prenatal and Postnatal Care. A. Sindoni Jr., Philadelphia.—p. 660.
Undulant Fever: Outbreak at Michigan State College. C. F. Holland, East Lansing.—p. 666.
Electrostethophone and Recording Apparatus for Fetal and Adult Heart. H. Kirschbaum, Detroit.—p. 671.

New Jersey Medical Society Journal, Trenton

37:437-486 (Sept.) 1940

Surgical Problems in Hereditary Polydactylism and Syndactylism. S. T. Snedecor and W. K. Harryman, Hackensack.—p. 443.
Carcinoma of Bladder. V. P. Butler, Jersey City.—p. 449.
Hospital Service Plans at the Crossroads: Review of Conditions to Be Met. P. Keller, New York.—p. 453.
Physical Therapy in General Practice. R. Kovacs, New York.—p. 458.
Public Health of Tomorrow. J. R. Morrow, Ridgewood.—p. 462.
Undulant Fever. F. W. Lathrop, Plainfield.—p. 466.

Northwest Medicine, Seattle

39:315-350 (Sept.) 1940

Digitalis: Its Uses and Abuses. N. C. Gilbert, Chicago.—p. 317.
Intestinal Obstruction: Review of Its Principles. D. G. Willard, Tacoma, Wash.—p. 322.
Role of the General Practitioner in Antituberculosis Campaign. R. W. Hemingway, Bend, Ore.—p. 326.
*Tuberculin Test, Changing Concepts and Uses. K. M. Soderstrom, Seattle.—p. 329.
Treatment with Vitamins. D. L. Wilbur, San Francisco.—p. 332.
Reconstruction of Lower Lip. A. F. Cunningham, Spokane, Wash.—p. 336.
Meckel's Diverticulum with Ectopic Gastric Tissue, Perforation and Hemorrhage. S. F. Herrmann, C. P. Larson and B. A. Brown, Tacoma, Wash.—p. 337.
Obstetric Analgesia and Anesthesia. J. C. Brougher, Vancouver, Wash.—p. 339.

Tuberculin Test.—Soderstrom points out that the belief that allergy and immunity to tuberculosis are one and the same thing is refuted by the analysis of the statistically significant studies on the tuberculin test made during the last few years in Tennessee. Too many indisputable x-ray evidences of healed tuberculosis were found in negative reactors to allow the standard teachings to go unchallenged. The Tennessee studies revealed that a person giving a negative tuberculin reaction is not necessarily one who has never been infected by the tubercle bacillus. The phenomenon of "allergy reversion" has been shown experimentally and can be deduced from available figures based on clinical observations. If, as is acknowledged, a relatively few years ago human beings were approximately 100 per cent positive reactors from the teen age to senility, what is there to explain the fact that those young adults, who were all positive a couple of decades ago, are approximately 50 per cent negative reactors today? It seems to the author that they have lost their allergy to tuberculin or that it has become diminished to the point that it is not detected by the cutaneous test. They have reverted from positive to negative states and there is no evidence that they have lost their expected resistance as acquired from a primary infection. Long explains this as a reversion due to lack of repeated allergy-producing doses of tubercle bacilli, which seem to be necessary for the maintenance of allergy. To argue that the rapid decline in positive reactors is making for a race of increased susceptibility is not considering inherited racial immunity, which, having been created during the centuries past, is hardly dependent on created allergy in the individual. At present it seems that the value of the tuberculin test, though changing, has led into newer and probably more fruitful fields of application. The clinical case of tuberculosis, the sick patient, will almost invariably react to a properly applied tuberculin test. A true tuberculin negative reactor rarely could have tuberculosis. This statement is of increasing importance when one considers that the day of almost universal positive reactors among adult population groups is passing into one in which the positive adult reactor is in the minority. The meaning of a positive adult reactor with or without pulmonary symptoms is becoming more and more indicative of pathologic changes. There may be the day when this is just as true as the relation that a positive Wassermann reaction bears to the person with clinical syphilis. In the light of the changing values of the tuberculin test its use in mass surveys and case finding attempts must be reappraised. The author does not believe that the justification for mass group testing exists today that existed several years ago. He does not question the merits of testing the school child, with the aim of using this to impress him with tuberculosis education. However, he points out that its most fruitful application as a case finding procedure is in the physician's office in his routine practice. If the clinician will remember that tuberculin should be used on the individual patient in question, not on the patient's relatives, and that all negative reactors should be rechecked with a stronger solution of potent tuberculin, using the proper intradermal technic, he will find an inexpensive procedure offering a substantial reward for the effort expended. Soderstrom believes that official health agencies can best give their attention to proper follow-up of known cases and of tuberculosis contacts through the practicing physicians' cooperation who use tuberculin in their practice. This cooperation will speed the day when eradication of tuberculosis may be a reality rather than a mere probability.

South Carolina Medical Assn. Journal, Greenville

36:241-266 (Sept.) 1940

Observations on Conduct of Labor. J. D. Guess, Greenville.—p. 241.
The Orthopedic Problem in the South. A. T. Moore, Columbia.—p. 244.
Regional Enteritis. A. F. Burnside, Columbia.—p. 249.

Surgery, St. Louis

8:409-574 (Sept.) 1940

Chordoma. V. Richards and D. King, San Francisco.—p. 409.
Variations in Origin and Course of Hepatic Artery and Its Branches: Importance from Surgical Point of View. E. Z. Browne, New Orleans.—p. 424.
Subcapsular Rupture of Liver in Child. T. F. Corriden, Northampton, Mass.—p. 446.
Intraperitoneal Use of Hypertonic Glucose Solution: Experimental Study with Reference to Prevention of Adhesions. H. P. Totten, Los Angeles.—p. 456.
Simple Apparatus for Relief of Some Palsies of Upper Extremities. E. Pólya, Budapest, Hungary.—p. 464.
Ethyl Chloride Spray for Sprained Ankles. L. Cozen and B. S. Hollombe, Los Angeles.—p. 468.
Radiation Therapy for Recurrent Sacrococcygeal Cysts and Sinuses. R. Turell, New York.—p. 469.
Conservative Management of Sigmoidoscopic Perforation. M. A. Sallick, New York.—p. 473.
Reliability of Roentgenographically Determined Pineal Gland Shift in Brain Tumors: Note. R. Y. Herren, Portland, Ore.—p. 478.

Virginia Medical Monthly, Richmond

67:525-592 (Sept.) 1940

Remarks Concerning Some of the Activities of the Medical Society of Virginia—1939-1940: Presidential Address. H. H. Trout, Roanoke.—p. 525.
Evaluation Study of Serodiagnostic Tests for Syphilis as Performed in Thirty Laboratories in Virginia. I. C. Riggin, E. M. Holmes Jr., O. L. Anderson, A. Corpening and Elsie Foxhall, Richmond.—p. 529.
Interpretation of the Drawings Made by Maladjusted Children. J. N. Williams, Richmond.—p. 533.
Stone in Urinary Tract. B. E. Harrell, Norfolk.—p. 538.
Injuries of Urinary Tract. A. A. Creecy, Newport News.—p. 542.
*Hypodermic Use of Adrenalin Chloride for Relief of Menstrual Cramps. J. T. Wolfe, Washington, D. C.—p. 548.
Discussion of Arterial Hypertensive Disease (Hypertension). W. N. Thompson, Stuart.—p. 551.
Calcium Problem in Obstetrics. J. Bear, Richmond.—p. 553.
Volatile Oil Poisoning: Case. R. von Lehn Buxton, Newport News.—p. 557.
Endocrinology Briefs: Pituitary Gland. J. P. Lynch, Richmond.—p. 558.
Acute Laryngotracheobronchitis: Report of Case. S. Newman and W. E. Dickerson, Danville.—p. 560.
Sulfanilamide Therapy Followed by Hemorrhages in Fundus of Eye. J. P. Baker Jr., Richmond.—p. 562.

Epinephrine for Relief of Menstrual Cramps.—Wolfe gave seven patients with dysmenorrhea hypodermic injections of epinephrine on the theory that contraction rings and menstrual cramps are produced by spasm of the cervical and uterine muscle fibers and that they can be relieved through the autonomic nervous system by stimulating the sympathetics. Five of the patients had a less severe type of disorder; they responded promptly and experienced relief within five minutes of the injection.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

28:1-160 (July) 1940

Sarcoma of Muscles and Connective Tissue Spaces of Limbs. G. Gordon-Taylor.—p. 1.
Skeletal Muscle Tissue Tumor. M. N. De and B. P. Tribedi.—p. 17.
*Treatment of Mixed Tumors of Parotid Gland. D. H. Patey.—p. 29.
Lung Injury in Intact Thorax: Report of Case. M. Fallon.—p. 39.
Carotid Ligation in Saccular Intracranial Aneurysms. J. Schorstein.—p. 50.
End Results and Treatment of Tuberculous Disease of Ankle and Tarsus. W. R. D. Mitchell.—p. 71.
Spontaneous Fracture of Apparently Normal Fibula in Its Lowest Third. H. J. Burrows.—p. 82.
Dislocations and Fracture Dislocations of Talus. J. G. Bonnin.—p. 88.
Delayed Ossification of Tibia in Apparent Congenital Absence. W. M. Dennison.—p. 101.
Fractures of Head and Neck of Radius. R. C. Murray.—p. 106.
Testicular Tumors: Nine Cases, Including Epididymoma and Chorioma. A. W. Adams.—p. 119.
Septicemia. L. E. H. Whitby.—p. 124.

Treatment of Mixed Tumors of Parotid Gland.—Patey reviews the present position on the treatment of mixed tumors of the parotid gland. He bases his conclusions on the experience of others as revealed in recent literature and on the surgical and x-ray records of cases seen at the Middlesex Hospital, some of which were under his care and some under the care of his colleagues. He concludes that the natural course of mixed parotid tumors is to increase in size at varying rates, leading to a corresponding degree of deformity but otherwise causing little disability. Spontaneous malignant change in a mixed tumor is so rare that it may be ignored. Surgical enucleation alone may be satisfactory, but recurrence is seen in too many cases, and in some of these the recurrence is directly responsible for the death of the patient. There should be no hurry to treat these tumors. A period of observation to determine the rate of growth may be advantageous. In mixed parotid tumors appearing late in life, and in slowly growing tumors appearing earlier, the correct treatment may be to do nothing. Radical excision of the parotid is too deforming to be a routine treatment. However, in exceptional cases this may be the correct procedure in which complete facial palsy is justifiable. Irradiation alone is not a satisfactory form of treatment. It may be a useful diagnostic measure, indicating whether the tumor is or is not radiosensitive. Preoperative irradiation is valuable, since it renders the capsule of the tumor tougher and less liable to rupture during operation. Enucleation followed by irradiation appears to be the best active treatment for mixed parotid tumors.

British Medical Journal, London

2:275-306 (Aug. 31) 1940

Effects of Precipitated Silica and of Iron Oxide on Incidence of Primary Lung Tumors in Mice. J. A. Campbell.—p. 275.
Rapid Death in Bile Peritonitis. D. M. Douglas and G. G. Turner.—p. 280.
Lipoid Pneumonia. S. A. Propert.—p. 282.
*Comparison of Toxicity of Tryparsamide and Neocryl in Treatment of Neurosyphilis. A. O. F. Ross.—p. 283.
Reception of Air Raid Casualties. H. A. Brittain and K. A. Latter.—p. 284.

Toxicity of Certain Arsenicals Used for Neurosyphilis.—From 1936 to July 1939 Ross treated 256 cases of neurosyphilis with tryparsamide and 314 with sodium succinanilomethylamide-*p*-arsonate (neocryl). The standard dose of each drug was 3 Gm. intravenously once a week until 30 Gm. had been administered. A survey of the records of the cases at least twelve months after the end of treatment has confirmed the early impression that the results obtained with neocryl are in no way inferior to those of tryparsamide. As the work progressed and it became evident that neocryl was relatively harmless, it was chosen for all cases exhibiting visual disturbance, optic atrophy, in which tryparsamide is contraindicated. The usual toxic reactions were considerably more frequent in the tryparsamide series than in the neocryl group. Neocryl did not cause any functional visual disturbance, but in one patient with tabes dorsalis after nine doses sudden and complete blindness occurred. The blindness which followed in three cases treated by tryparsamide was gradual in its development. In three cases optic atrophy present before the administration of neocryl became worse but in nine other known cases no ill effect was produced. Of 256 cases treated with tryparsamide seventy-eight exhibited toxic manifestations, whereas of 314 cases treated with neocryl only twenty-seven had toxic reactions. Both compounds may cause jaundice, dermatitis and other undesirable reactions seen after the administration of trivalent arsenicals; but it is chiefly in its relative innocuity to the optic nerve that the advantages of neocryl become apparent. Visual disturbance occurred in forty-seven of the seventy-eight cases which reacted unfavorably to tryparsamide: in thirty-six the signs were subjective but in eleven they were objective; in three total blindness developed. Neocryl was accountable for only one case of visual damage. The author believes that neocryl is to be preferred in all cases of neurosyphilis in which the administration of pentavalent arsenicals is necessary.

Lancet, London

2:253-286 (Aug. 31) 1940

Late Complications of Abdominal War Wounds. W. H. Ogilvie.—p. 253.
A Week-End with War Neuroses. M. Culpin.—p. 257.
Assessment of Level of Nutrition: Tests for Vitamin C on Groups of Poorly Fed and Well Fed School Children. L. J. Harris.—p. 259.
*Treatment of Tetanus with Evipal Soluble and Sulfapyridine. J. Bryant and H. D. Fairman.—p. 263.

Evipal Soluble and Sulfapyridine for Tetanus.—In the course of an outbreak of cerebrospinal meningitis in the Dinka districts in Equatoria province of the Anglo-Egyptian Sudan, Bryant and Fairman observed that patients with tetanus were occasionally brought to Sudan Medical Service dressers in treatment centers established in the infected districts. Some dressers had seen tetanus before and recognized it; others had not. Relations of the sick, if told that the patient had not cerebrospinal meningitis but tetanus, as a rule demanded treatment and lumbar puncture. The treatment was always given by the dresser as for cerebrospinal meningitis by lumbar puncture and injections of sulfapyridine. During the constant patrolling of the epidemic areas the authors saw these cases in treatment centers and administered evipal soluble (evipan sodium), leaving enough of the drug with the dresser to keep the patient quiet or, if necessary, anesthetized for three or four days. All of the twenty-two cases of tetanus recorded here were typical and severe and without treatment most would probably have had a fatal outcome in a day or two. However, under treatment with sulfapyridine and continued or intermittent narcosis with evipal soluble all but five recovered. The authors also state that during the last few years cases of tetanus were occasionally treated with evipal soluble alone. Results have been fair and unexpected recoveries made. Numbers are too small for analysis, but if the patient could be kept alive for five or six days he seemed to have a good chance of recovery. Lumbar puncture was always performed. Recovery in these cases was always extremely slow and wasting was pronounced. In the light of this experience with evipal soluble alone, the authors think that in the cases treated with sulfapyridine and evipal soluble, recovery has been too rapid and mortality too low to be explained away entirely by the muscular rest produced by prolonged narcosis. They suggest that it is possible to save many patients with tetanus in remote places where high temperatures and inaccessibility preclude the use of serum.

Chinese Medical Journal, Peiping

57:501-622 (June) 1940

Relationship Between Canine and Human Kala-Azar in Peiping and Identity of Leishmania Canis and Leishmania Donovani. H.-L. Chung.—p. 501.
Effect of Cooking on Vitamin C Content of Vegetables. T. F. Yü.—p. 523.
Thiersch Skin Grafting: Use of Collodion Gauze Technic. C. Szutu and C. Y. Chen.—p. 535.
Clinical Application of Plasma Viscosity Determination: Description of Pipet Viscosimeter and Report on Findings in Tuberculosis. B. H. Y. T'ang and S. H. Wang.—p. 546.
Homogeneity of Bacteriophagic Types of Bacillus Typhosus Isolated from Patients and Carriers. C. H. Yen.—p. 556.
Studies on Food and Digestive System of Certain Parasites: VI. Food of Certain Helminths Living in Digestive Tract of Vertebrates. H. F. Hsü and S. Y. Li.—p. 559.
Deformities in Refugees Owing to Intramuscular Hemorrhages in Scurvy. S. Hoyte.—p. 568.
Osteomyelitis Variolosa: Report of Case. P. L. Fan.—p. 571.
Rupture of Stomach in Opium Poisoning: Case Report. W. N. Bien and S. D. Wu.—p. 574.

Annali di Ottal. e Clin. Ocul., Genoa

68:161-240 (March) 1940

Modifications of Adnexa Oculi Due to Acanthosis Nigricans. M. Corrado.—p. 161.
*"Parinaud's Conjunctivitis." A. Castelli and L. Molina.—p. 179.

Parinaud's Conjunctivitis.—Castelli and Molina were able to isolate from an exogenously infected human subject an acid-fast organism which they regard as the true infective agent in Parinaud's conjunctivitis and as a new species of mycobacterium. This organism is intensely pathogenic for certain laboratory animals but induces a mild infection in man. The authors were able to observe its morphologic, biologic and staining characteristics under aerobic and anaerobic conditions during the course of three years and conducted extensive experiments on more than 200 animals. The bacillus, in their opinion, is definitely differentiable from Mycobacterium tuberculosis, human and bovine, by significant biologic and cultural traits. Anatomopathologic and microscopic examinations of the lesions produced in the lungs, liver, lymph nodes, iris and conjunctiva and tuberculin assays for differential diagnosis confirmed their discovery. Animals immunized against tuberculosis by repeated inoculations with BCG vaccine succumbed to the infection of the new organism but successfully resisted high doses of virulent Koch bacillus. The authors believe that Parinaud's conjunctivitis is a definite disease entity and not a syndrome provocable by a variety of pathologic causes. Atypical cases of Parinaud's conjunctivitis are probably of tuberculous origin. Clinically the disease presents itself as foci of subepithelial infiltrations that rarely ulcerate and consist predominantly of mononuclear elements; plasma cells are occasionally found in considerable number, especially about the periphery of the nodules; polymorphonuclear and giant cells are rare. An extensive clinical and bibliographic material is subjoined.

Rassegna di Fisiopatologia, Pisa

12:193-240 (May) 1940

*Protein Picture of Blood and Ascitic Fluid in Atrophic Cirrhosis of Liver. D. Mircoli and M. Ferroni.—p. 193.
Studies on Permeability in Man of Kidneys by Dextrose: III. Effect of Adrenal Cortex Extract and Epinephrine. C. Bianchi.—p. 216.

Blood and Ascitic Fluid Protein in Cirrhosis.—Mircoli and Ferroni studied the relation between the protein levels of the blood and those of the ascitic fluid before and after paracentesis in cases of atrophic cirrhosis of the liver. Their observations of the modifications of protein levels included those of the albumin and globulin content and were based on more than 100 biochemical assays carried out during two to eight months on four cirrhotic patients. Total blood protein levels maintained a notable constancy throughout the course of the disease; however, initial and final levels hovered near the lowest normal limits. In the final stages of the disease with marked hepatic insufficiency the protein levels did not vary from those initially observed. Only a moderate reduction in the protein content of the blood was caused by the withdrawal of ascitic fluid in the majority of cases. Restoration of previous levels usually occurred within a week. The effect of paracentesis on the albumin and globulin fractions was to reduce, at first, the albumin content and to increase the globulin content. Total protein levels of the ascitic fluid behaved differently from those of the blood, showing a decrease after paracentesis. In general, high globulin levels in the blood were associated with high globulin levels of the ascitic fluid, both before and after paracentesis. In the great majority of tests of the protein quotients of the ascitic fluid, a clear tendency was exhibited by the globulins to predominate over the albumins. The effect of paracentesis on the protein quotients of the ascitic fluid was to increase it more often than to decrease it. The authors question the significance attached to the function of the liver in the production of blood proteins in general and of albumins and globulins in particular. They base their doubts on the observations that, even in late stages of atrophic cirrhosis of the liver in which decided hepatic insufficiency has occurred, almost unchanged blood protein levels are encountered.

Día Médico, Buenos Aires

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Antitumoral Endocrine Factors. L. Vargas.—p. 102.
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*Presence of Ether-Soluble Protein in Serum of Persons with Neoplasms. C. Esculies and J. Esculies.—p. 116.
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*Postoperative Adrenal Insufficiency. A. Lucena, A. Peregrino, C. Ramos and N. Bethlem.—p. 123.

Ether Soluble Protein in Serum of Patients with Neoplasms.—Their previous isolation of an ether-soluble substance from the serum of cancer patients for the diagnosis of carcinoma (nineteen cases analyzed) was confirmed by Carlos and José Esculies, using a revised technic that employed T. B. Robertson's microrefractometric method for serum analysis of minute globulin and albumin percentages in the blood serum. Observations of carcinomatous and other patients after total extirpation of the tumor growth had shown that reactions, previously positive, had become negative. This was not true for partial extirpation. The ether-soluble substance isolated is regarded by the authors as of protein nature and is susceptible of precipitation by sodium sulfosalicylate. Further observations directed to the albumin and globulin fractions of the protein disclosed that the reactive property resided in the globulins but only as vectors of the ether-soluble protein, not as substances independently capable of eliciting positive response, though hyperglobulinemia was regularly found in all serums. This ether-soluble protein in cancer patients may either be the product of an abnormal metabolism of the cancer cells vitiating normal protein metabolism or a protective ferment called into being against the invasion of abnormally metabolized protein derivatives. Both interpretations are correlated with the observations of previous investigators. The problem of establishing whether the protein isolated by the authors possesses fermenting activity in the presence of the same serum from which it is extracted as well as that of determining the precise polarimetric deviation requires further investigation.

Postoperative Adrenal Insufficiency.—Lucena and his associates investigated the effect of surgical intervention on the activity of the adrenal glands in twenty-three cases, five of which presented a grave clinical picture, from the point of view of the modifications of sodium and potassium levels of the blood. Basing their biochemical calculations on a normal standard of from 18 to 20 mg. per hundred cubic centimeters for potassium and from 320 to 340 mg. for sodium in the blood, they found clear evidence of postoperative upset of balances equivalent to adrenal insufficiency, entailing clinical manifestations of varying intensity, in every case. An abnormal ratio of both chemicals was ascertained in 85.7 per cent of the cases. In 10.7 per cent the potassium content was normal but the sodium levels had fallen below normal; on the other hand, in 3.6 per cent of the cases normal sodium levels were associated with an increased potassium count. Sixteen of eighteen cases examined (88.88 per cent) showed hypotension. The authors believe that every surgical intervention constitutes an invasion of the adrenal glands, capable of inducing a grave and even fatal insufficiency in serious and atypical cases.

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New Operation Knife. E. Perman.—p. 1083.
*Tuberculous Bone Foci. G. Odelberg-Johnson.—p. 1084.

Tuberculous Bone Foci.—Odelberg-Johnson states that the tuberculous bone focus is a part symptom of tuberculous infection and that treatment must be directed against the general tuberculous disease. By local treatment in the form of operative and orthopedic intervention and long-continued fixation and elimination of weight bearing, local healing and maintenance of function can be attained in the best cases, especially when removal of the bone focus is possible. As a rule there is healing with limited function. Sometimes the process continues in spite of general and local treatment. The author emphasizes the importance of carrying out major operative or orthopedic measures when the general condition is optimal and the activity of the tuberculous infection is minimal, while on the other hand treatment must not be so conservative that the indicated intervention is delayed too long.